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✓ PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES IN THE UNITED STATES

Third Series - Report No. 12
1978 Ford 140 CID (2.3 Liters), 2V

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W.F. Marshall

U.S. DEPARTMENT OF ENERGY
BARTLESVILLE ENERGY TECHNOLOGY CENTER
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INTERIM REPORT



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16. Abstract Experimental data were obtained in dynamometer tests of a 1978 Ford 140 CID engine to determine fuel consumption and emissions (hydrocarbon, carbon monoxide, oxides of nitrogen) at steady-state engine operating modes. The objective of the program is to obtain engine performance data for estimating emissions and fuel economy for varied engine service and duty. The intent of the work is to provide basic engine characteristic data required as input for engineering calculations involving ground transportation.			
			
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PREFACE

This report, prepared by the U.S. Department of Energy, Bartlesville Energy Technology Center for the U.S. Department of Transportation, Transportation Systems Center, Energy Technology Branch, Cambridge MA, presents results of experimental work to obtain information on performance characteristics of an engine used in automobiles sold in the United States.

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James A. Kidd, Jr. of the U.S. Department of Transportation, Transportation Systems Center, is the technical monitor.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol	When You Know	Multiply By	To Find
LENGTH							
in	inches	.75	centimeters	mm	millimeters	.004	inches
ft	feet	30	centimeters	cm	centimeters	.04	inches
yd	yards	0.9	meters	m	meters	3.3	feet
mi	miles	1.6	kilometers	km	kilometers	1.1	yards
AREA							
in ²	square inches	6.5	square centimeters	cm ²	square centimeters	0.16	square inches
ft ²	square feet	0.09	square meters	m ²	square meters	1.7	square feet
yd ²	square yards	0.9	square meters	m ²	square kilometers	0.4	square miles
mi ²	square miles	2.6	square kilometers	km ²	hectares [10,000 m ²]	2.6	acres
MASS (weight)							
oz	ounces	.28	grams	g	grams	0.035	ounces
lb	pounds	0.45	kilograms	kg	kilograms	2.2	ounces
or	short tons (2000 lb)	0.9	tonnes	t	tonnes	1.1	short tons
VOLUME							
ts	teaspoons	6	milliliters	ml	milliliters	0.03	fluid ounces
Tbsp	tablespoons	15	milliliters	ml	liters	2.1	ounces
fl oz	fluid ounces	30	milliliters	ml	liters	1.06	quarts
c	cups	0.24	liters	l	liters	0.76	gallons
pt	pints	0.47	cubic meters	m ³	cubic meters	35	cubic feet
qt	quarts	0.95	cubic meters	m ³	cubic meters	1.3	cubic yards
gal	gallons	3.6	cubic meters	m ³	cubic meters	1.3	cubic yards
yd ³	cubic feet	0.03	cubic meters	m ³	cubic meters	1.3	cubic yards
TEMPERATURE (exact)							
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature
TEMPERATURE (exact)							
1 in = 2.54 centimeters; 1 foot = 0.3048 meters; 1 pound = 0.4536 kilograms; 1 liter = 0.264175 cubic feet; 1 acre = 4046.86 square meters.							
Units of capacity and measures. Price 17.75. Old Edition. Copyright 1968, Rand McNally & Company.							

1. INTRODUCTION

The objective of this program is to obtain engine performance data for estimating fuel economy and emissions for varied engine service and duty. The intent of work done at the Bartlesville Energy Technology Center is to provide basic engine characteristic data required as input for engineering calculations of fuel consumption and emissions involving ground transportation.

The data acquired from tests of a 1978 Ford 140-CID engine are presented in this report. Ford uses the 140-CID engine as equipped in a Pinto which is in the 2,750 lb inertia weight class. The engine as equipped is intended for use in a California vehicle with automatic transmission. The test results are sufficient to establish steady-state maps for fuel consumption and emissions (carbon monoxide, unburned hydrocarbon, and oxides of nitrogen) over the entire operating range of the engine.

2. ENGINE TEST REPORT

The engine test setup included a complete engine (SAE definition) coupled to an eddy-current dynamometer. A cooling tower was used in the place of the fan and radiator. The alternator was included but was not wired into the engine's electrical system.

The emission control system consists of a dual catalytic converter (the upstream half of the catalyst is a 3-way catalyst, and the other half is a conventional oxidation catalyst) with feedback control monitoring the exhaust oxygen concentration and controlling the fuel flow to produce a stoichiometric exhaust mixture. The control loop consists of a zirconium dioxide sensor to measure oxygen concentration, an electronic control unit, a vacuum regulator to proportion a vacuum signal to the carburetor, and a carburetor with vacuum modulated main fuel system. The system also includes exhaust gas recirculation and an air-injection system that injects secondary air into the exhaust manifold when the coolant temperature is below 125° F and into the catalyst assembly just ahead of the conventional oxidation catalyst when the coolant temperature is above 125° F. The manufacturer's specifications for the 1978 Ford 140-CID engine are given in Table 1.

Prior to testing, engine break-in consisted of 40 hours of operation at various speeds/load modes representative of normal engine operation. Table 2 contains details of the break-in schedule. A single batch of unleaded regular grade gasoline was used throughout the break-in and tests; a detailed fuel analysis is given in table 3. Engine testing began on November 7, 1978, and ended on December 27, 1978.

During steady-state tests the engine was operated at the following speed/load modes:

Speeds: 1,000; 1,600; 2,200; 2,800; 3,300; 3,900; 4,400;
4,800 rpm

Loads: 0, 10, 25, 40, 60, 75, 90, 100 pct of full load
(0, 10, 25, 60, and 75 pct points were repeated
for all engine speeds)

Idle speed/load modes: 850 rpm -- 0, 10, 15 lb-ft
750 rpm -- 6 lb-ft

Over-speed mode: 5,000 rpm -- 86 lb-ft (wide-open-throttle)

Total number of test modes.....	68
Total number of repeats.....	45
Total number of tests.....	113

The following data were recorded for each test point:

Test number

Data source code (1 = before catalyst, 2 = after catalyst)

Date

Barometric pressure, mm Hg
Wet bulb temperature, °F
Dry bulb temperature, °F
Inlet air temperature, °F
Speed, rpm
Torque, lb-ft -- Daytronic strain gauge load cell
Fuel rate, lb/hr -- Fluidyne positive displacement fuel flow meter
Ignition timing, °BTC
Manifold vacuum, in. Hg
Intake manifold pressure, in. Hg
CO, pct -- Beckman NDIR
CO₂, pct -- Beckman NDIR
O₂, pct -- Beckman polarographic detector
HC, ppmC -- Custom-built heated flame ionization detector
NO_x, ppm -- Thermo-Electron chemiluminescent detector
Oil temperature, °F
Coolant temperature, °F
Exhaust temperature, °F
Exhaust pressure, in H₂O
Intake manifold temperature, °F

The following equations were used in calculating power, air-fuel (A/F) ratio, absolute humidity, and mass emission rates of carbon monoxide (CO), unburned hydrocarbons (HC), and oxides of nitrogen (NO_x):

1. Partial pressure of water vapor in intake air (millimeters of mercury):

$$P = \exp \left[18.717 - \frac{7308.1}{393 + D} \right]$$

where D = Dew point, °F

2. Absolute humidity (grains moisture per pound dry air):

$$H = \frac{4347.8(P)}{B - P}$$

where B = Barometric pressure, mm Hg

3. Humidity correction factor (dimensionless):

$$K_H = \frac{1}{1 - 0.0047(H - 75)}$$

Note: This factor is used to correct the NO_x mass emission rate to a standard humidity of 75 grains moisture per pound dry air.

4. Hydrogen concentration in raw exhaust (percent):

$$H_2 = \frac{x(CO)(CO + CO_2)}{2(CO + 3CO_2)}$$

where CO = Carbon monoxide concentration (percent)

CO₂ = Carbon dioxide concentration (percent)

x = Fuel hydrogen/carbon atomic ratio

Note: This equation assumes a water-gas shift equilibrium constant:

$$\frac{(CO)(H_2O)}{(CO_2)(H_2)} = 3$$

5. Correction factor for emission concentrations from wet basis to dry basis (dimensionless):

$$C_w = 1 + \frac{(x/2)(CO + CO_2) - H_2}{100}$$

Note: In these tests only HC is measured on a wet basis.
All other species are measured on a dry basis.

6. Air-fuel ratio (dimensionless):

$$AF = \frac{68.9994}{MW_{fuel}} \left[\frac{(1 + \frac{x}{2} - y)(CO) + (2 + \frac{x}{2} - y)(CO_2) + 2(O_2) + \frac{NO_x}{10^4} - H_2}{CO + CO_2 + C_w(HC/10^4)} \right]$$

where O₂ = Oxygen concentration (percent)

NO_x = Oxides of nitrogen (ppm)

HC = Unburned hydrocarbon concentration (ppmC)

y = Fuel oxygen/carbon atomic ratio

MW_{fuel} = Fuel molecular weight per carbon atom

$$= 12.01115 + 1.00797x + 15.9994y$$

7. Carbon monoxide mass emission rate (grams per hour):

$$M_{CO} = \left(\frac{MW_{CO}}{MW_{fuel}} \right) \left[\frac{(\%CO)(M_f)}{\%CO + \%CO_2 + C_w(\%HC)} \right] \left(453.59237 \right)$$

MW_{CO} = Molecular weight of CO (28.0155)

M_f = Fuel rate in lb/hour

%HC = HC(ppmC)/10⁴

8. Unburned hydrocarbon mass emission rate (grams per hour):

$$M_{HC} = \left(\frac{MW_{HC}}{MW_{fuel}} \right) \left[\frac{(\%HC)(M_f)(C_w)}{\%CO + \%CO_2 + C_w(\%HC)} \right] (453.59237)$$

MW_{HC} = Molecular weight of hydrocarbon per carbon atom
 $MW_{HC} = 12.01115 + 1.00797x + 15.9994y$

9. Oxides of nitrogen mass emission rate (grams per hour):

$$M_{NOX} = \left(\frac{MW_{NOX}}{MW_{fuel}} \right) \left[\frac{(\%NOX)(M_f)}{\%CO + \%CO_2 + C_w(\%HC)} \right] (453.59237) K_H$$

MW_{NOX} = Molecular weight of NO_2 = 46.0055

$\%NOX$ = $NO_X(ppm)/10^4$

10. Power (brake horsepower corrected to a standard barometric pressure of 736.6 mm Hg and a standard temperature of 85° F):

$$HP = \left(\frac{(N)(T)}{5252.113} \right) \left(\frac{736.6}{B - P} \right) \sqrt{\frac{t + 460}{545}}$$

where N = Engine speed (revolutions per minute)

T = Brake torque (ft-lb)

t = Air temperature (°F)

3. DISCUSSION OF TEST RESULTS

Maximum corrected brake horsepower, maximum torque, and brake specific fuel consumption (bsfc) are plotted as functions of engine speed at wide-open-throttle (WOT) in figure 1. The maximum brake horsepower and the maximum torque produced by the engine were slightly lower than the values quoted in Table 1 (9 percent and 7 percent, respectively) but were produced at the specified speeds. Minimum bsfc occurred at 3,300 rpm, indicating a high efficiency mode at this speed.

The fuel rates were found to be nearly a linear function of power for most engine speeds except for the WOT load modes at some speeds where fuel-rich operation caused a significant increase in fuel rates (figure 2). Fuel rates were repeated for all speeds duplicated. The A/F ratio measured before the catalyst reflects the actual stoichiometry in the combustion chamber and remained between 14 and 16 for all modes except at WOT where the A/F ration significantly decreased (Figure 3). The A/F ratio measured after the catalyst was significantly higher, due to the injection of secondary air into the catalyst to support the oxidation process of the conventional oxidation catalyst.

Both the before-catalyst and after-catalyst exhaust emissions of CO, HC, and NO_x are plotted as functions of power for all engine speeds (figures 4 thru 6). These figures indicate the engine emission levels and the effectiveness of the dual catalytic converter. The injection of secondary air into the catalyst assembly provided sufficient oxygen to support the oxidation process of the conventional oxidation catalyst. This effectively reduces the emissions of CO and HC at all modes except those modes at WOT.

4. CONCLUSIONS

The experimental work to obtain performance data for the Ford 140-CID engine has been completed; these data are presented in the tables accompanying this report.

TABLE 1. MANUFACTURER'S ENGINE SPECIFICATIONS

Displacement, cubic inches.....	140
Maximum horsepower, bhp @ 4,800 rpm.....	88
Maximum torque, lb-ft @ 2,800 rpm.....	118
Bore and stroke, inches.....	3.781 x 3.126
Configuration.....	Inline, 4-cylinder camshaft
Compression ratio.....	9 to 1
Firing order.....	1-3-4-2
Ignition timing at idle speed, BTCD @ 600 rpm.....	17°
Block material.....	Cast iron
Head material.....	Cast iron
Number of crankshaft main bearing.....	5
Number of compression rings/piston.....	2
Number of oil rings/piston.....	1
Cam drive type.....	Belt
Valve timing:	
Intake opens, °BTC.....	22
Intake closes, °ABC.....	66
Exhaust opens, °BBC.....	64
Exhaust closes, °ATC.....	24
Spark plug gap, inches.....	.034
Weight of engine, pounds.....	375
Crankcase emission control:	
Control method.....	Positive crankcase ventilation
Point of discharge.....	Carburetor spacer
Carburetor type.....	2-V, downdraft
Distributor specifications:	
Centrifugal advance, begins, ° @ 1,600 rpm.....	1
Centrifugal advance, intermediate, ° @ 3,000 rpm.....	5
Centrifugal advance, full, ° @ 5,000 rpm.....	13
Vacuum advance, begins, ° @ 2.3 in. Hg.....	0
Vacuum advance, maximum, ° @ 15.75 in. Hg.....	24
Carburetor number.....	D8EE-EA
Distributor number.....	D7EE-CA
Exhaust-gas-recirculation:	
Valve number.....	87EE-9D475-G2A
Valve type.....	Internal tapered stem
Point of exhaust injection.....	Carburetor spacer
Air injection system:	
Air pump type.....	Vane, constant displacement
Point of injection.....	Exhaust manifold and mixing chamber in dual catalytic converter

TABLE 2. ENGINE BREAK-IN SCHEDULE

Simulated vehicle speed, mph	Engine speed, rpm	Intake manifold vacuum, in. Hg	Fraction of time in mode
Idle	850	18.8	1/10
20	1,000	16.4	"
30	1,350	16	"
40	1,800	11.5	"
50	2,200	12	"
60	2,650	11	"
25	1,100	16.5	"
35	1,550	15.5	"
45	2,000	12.5	"
55	2,400	12	"

Mileage per cycle = 90 miles.

Total mileage accumulated over 40 hour break-in period = 1,440 miles.

TABLE 3. FUEL ANALYSIS

Fuel No.....	7718
Research octane No.....	91.8
Motor octane No.....	84.0
Specific gravity.....	0.717
API gravity, degrees.....	65.9
Distillation, °F:	
10 pct evaporated.....	123
50 pct " 	209
95 pct " 	402
100 pct " 	413
Reid vapor pressure, psi.....	11.26
FIA analysis, pct:	
Aromatics.....	9
Olefins.....	15
Paraffins.....	76
Sulfur, pct.....	0.016
Lead, grams per gallon.....	Trace
Hydrogen/carbon atomic ratio.....	2.038

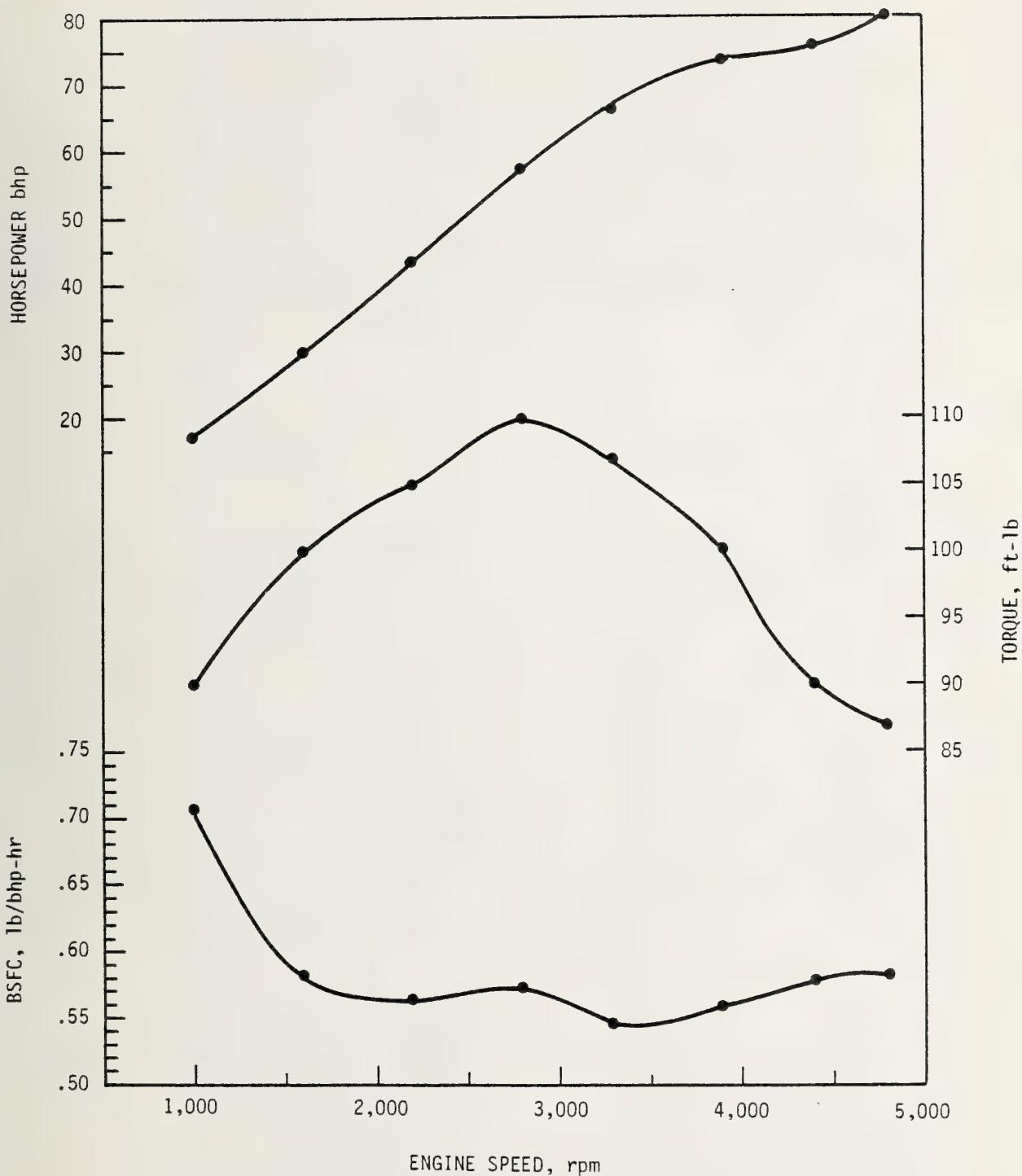


FIGURE 1. Brake Specific Fuel Consumption, Torque and Brake Horsepower Versus Engine rpm at Wide-Open-Throttle--Ford 140 CID Engine.

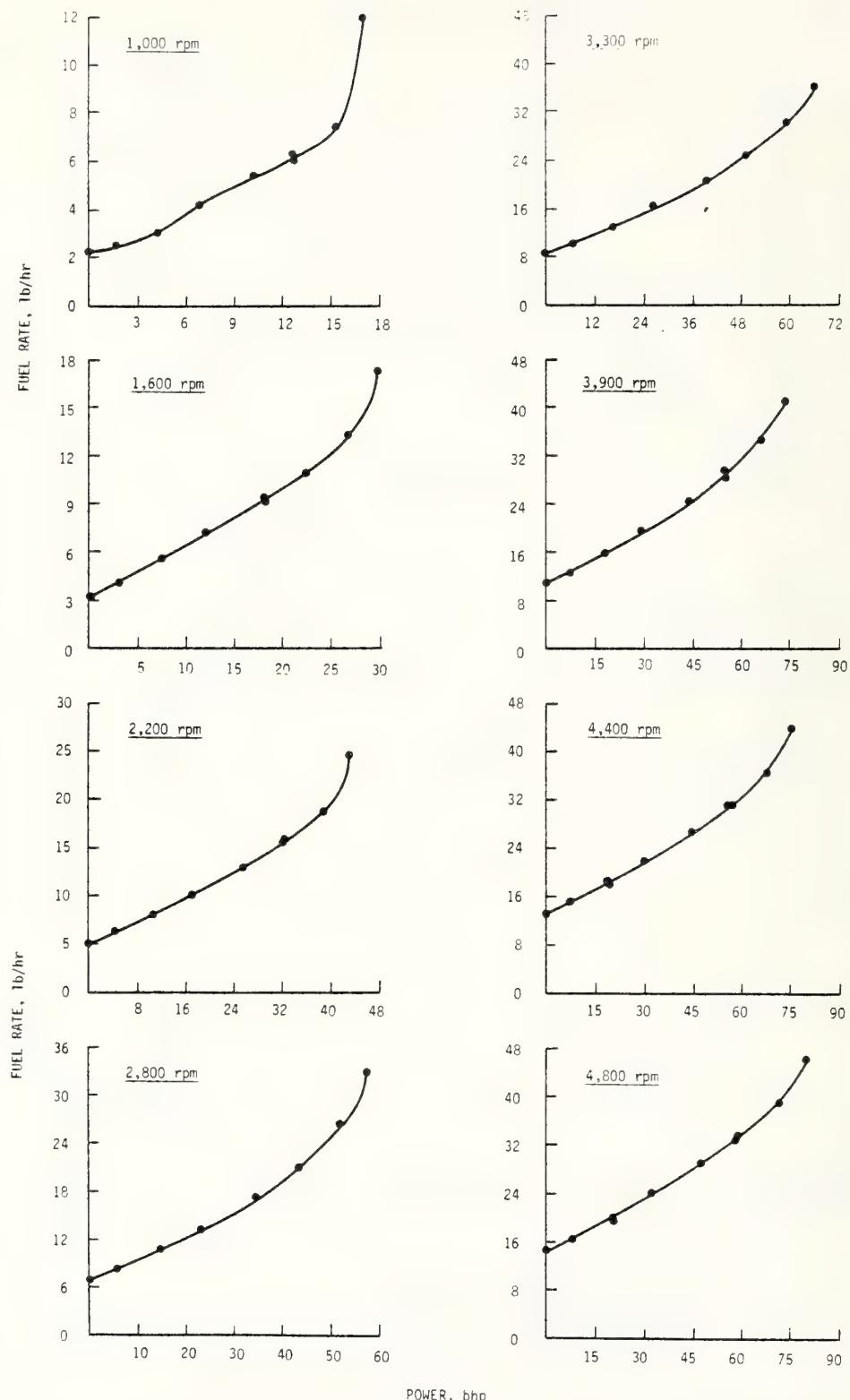


FIGURE 2. Fuel Rate Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

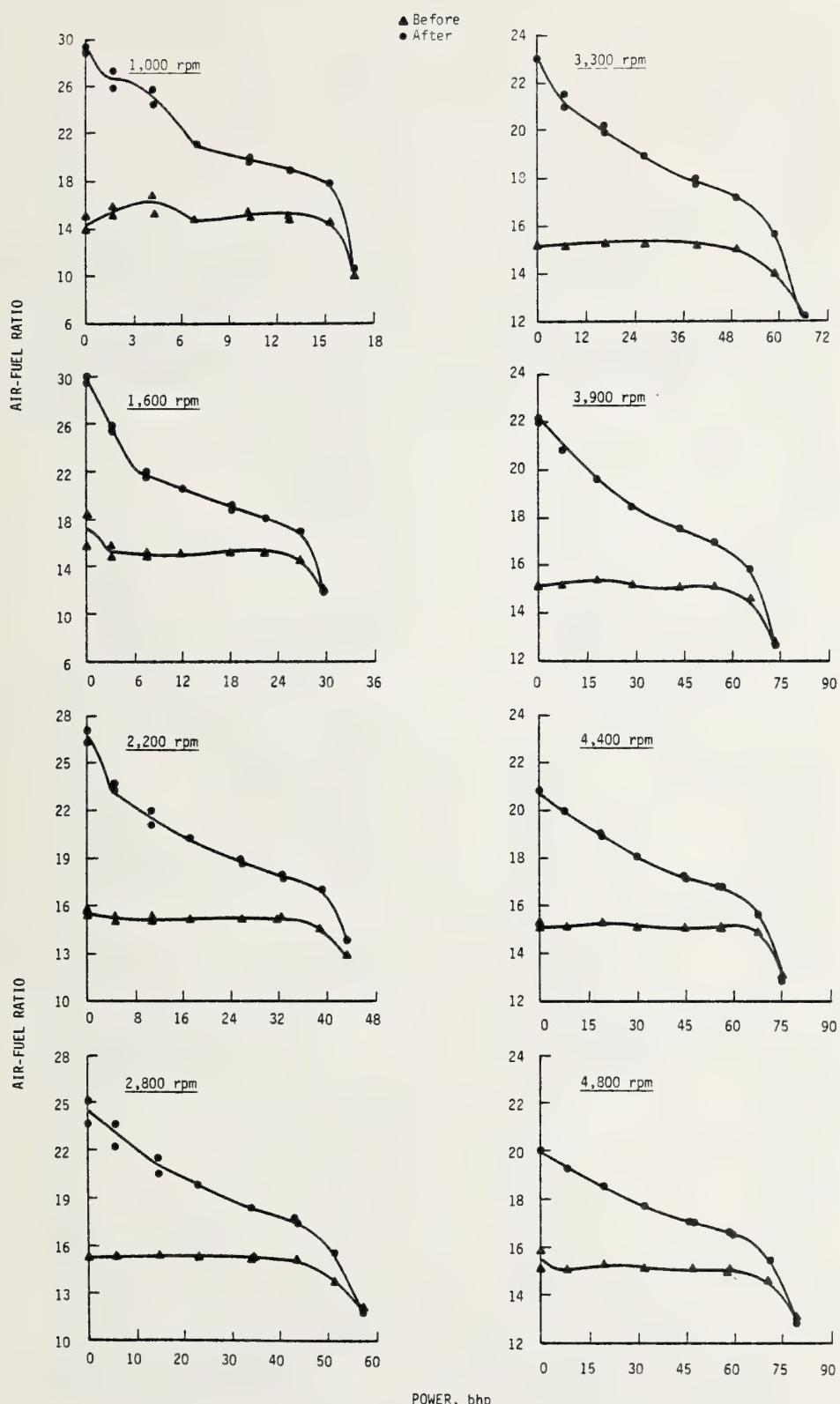


FIGURE 3. Air-Fuel Ratio Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

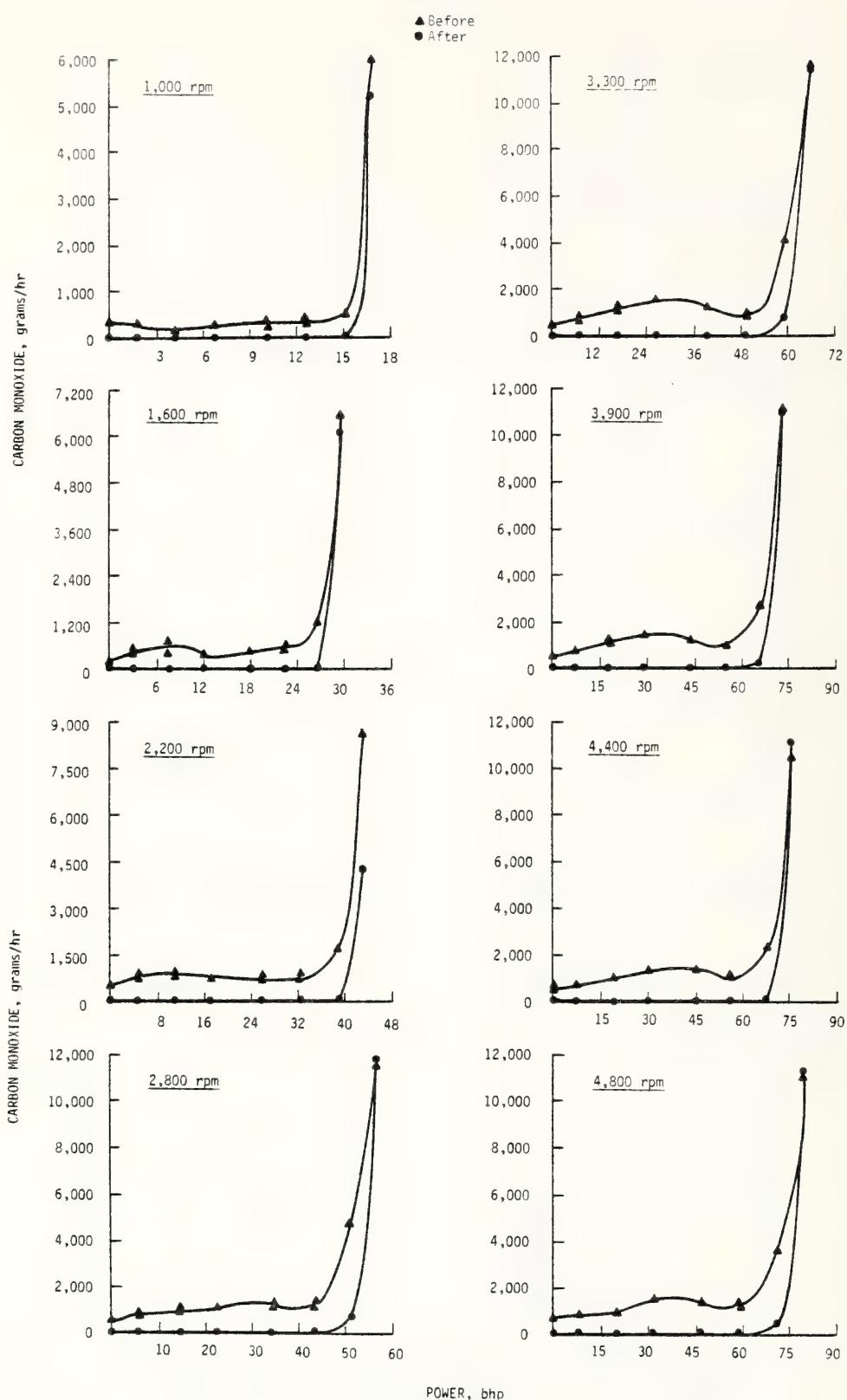


FIGURE 4. Carbon Monoxide Emissions Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

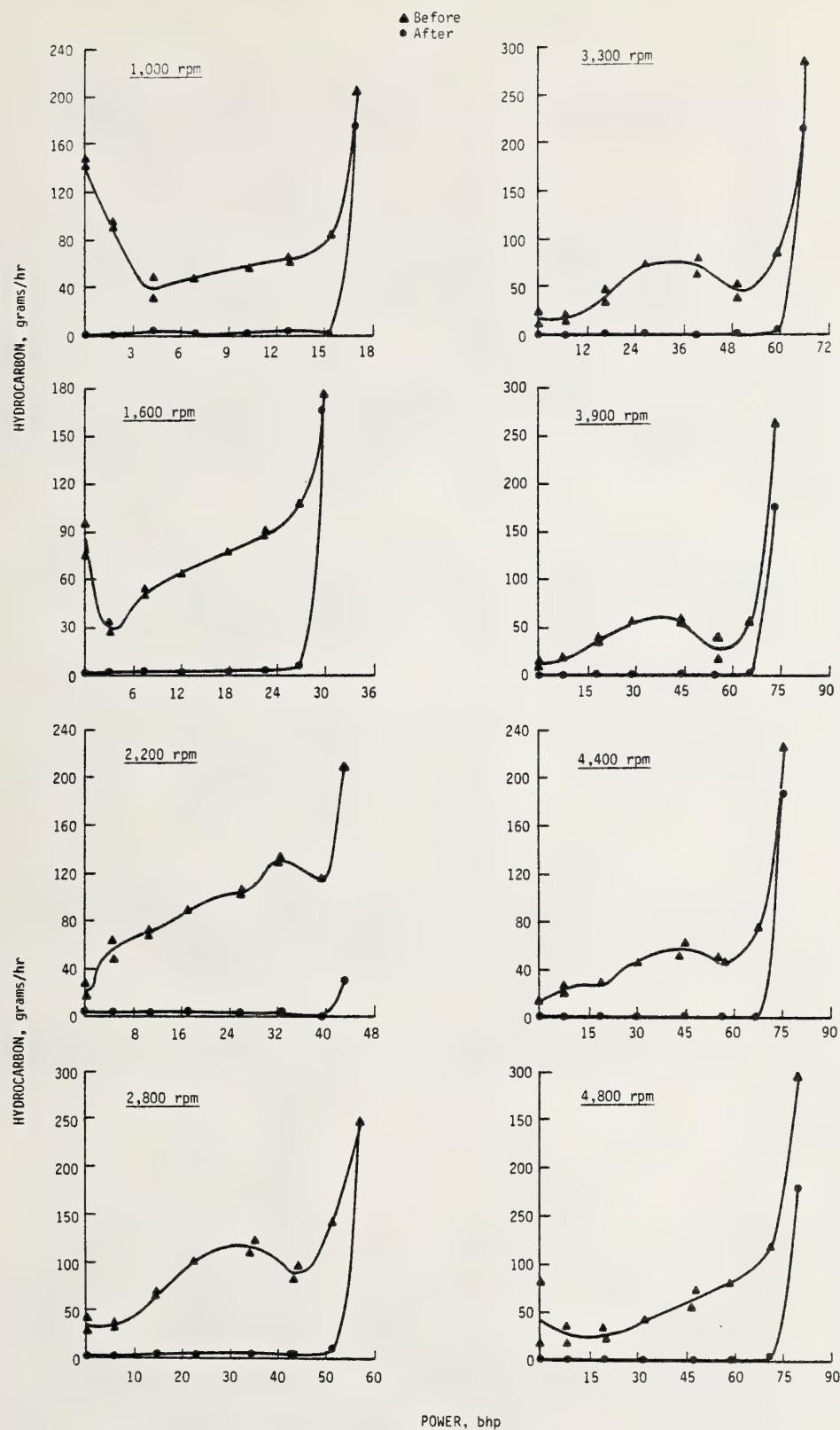


FIGURE 5. Hydrocarbon Emissions Versus Power At Various Speed and Load Conditions--Ford 140-CID Engine.

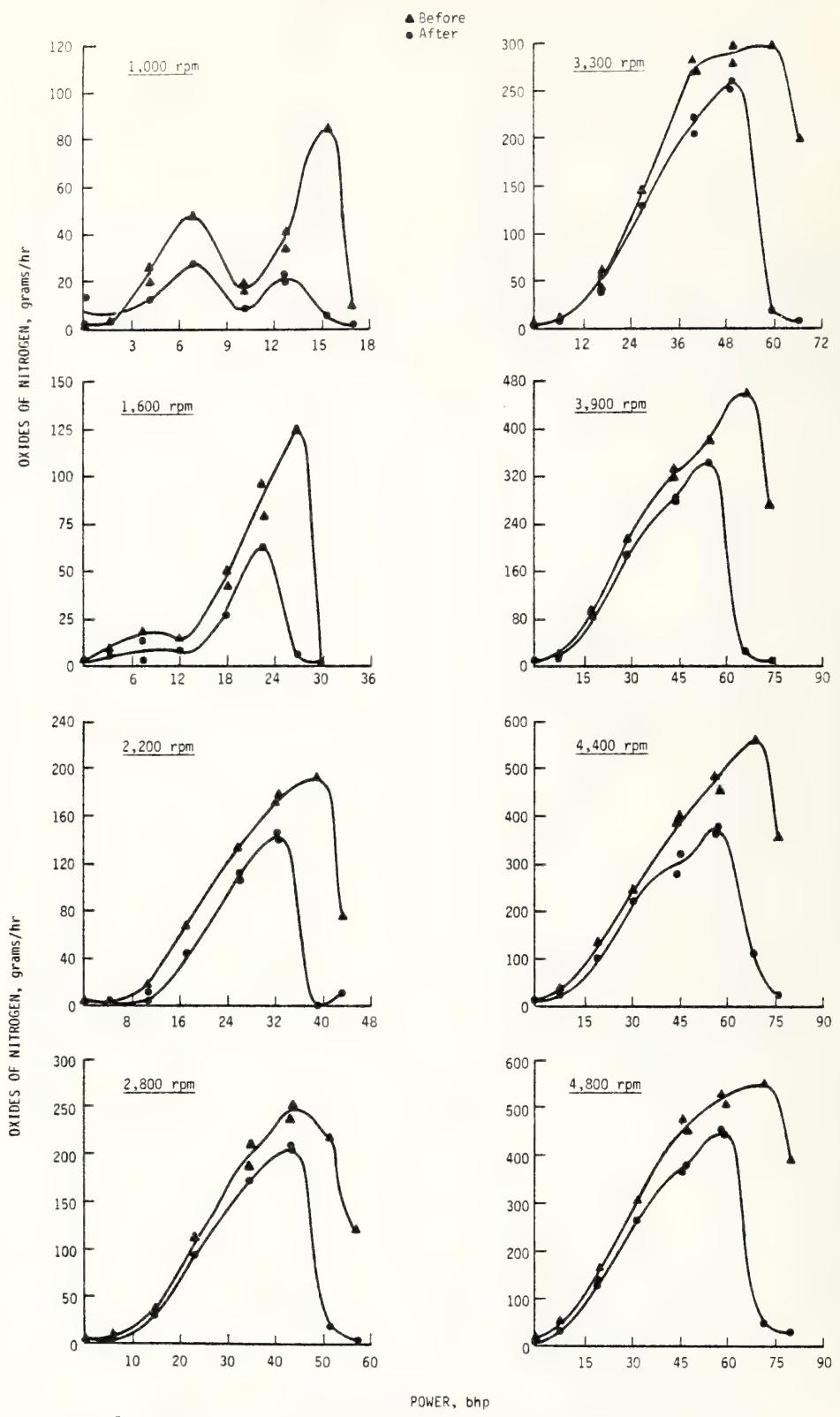


FIGURE 6. Oxides of Nitrogen Emissions Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	1.01	1.02	2.01	2.02	3.01	3.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE	1	2	1	2	1	1	2
TEST DATE	11/7/78	11/7/78	11/7/78	11/7/78	11/7/78	11/7/78	11/7/78
BAROMETER, MMHG	751.5	751.5	750.5	750.5	750.5	750.5	750.5
HUMIDITY, GRAINS/LB	49	49	49	49	49	49	49
TEMPERATURE, F	76	76	76	76	76	76	76
ENGINE SPEED, RPM	850	850	850	850	850	850	850
TORQUE, FT-LB	0	0	0	0	0	0	0
POWER, BHP*	2.0	2.0	2.0	2.0	2.0	2.0	2.0
FUEL RATE, LB/HR	37.0	37.0	37.0	37.0	37.0	37.0	37.0
IGNITION TIMING, DEG BTDC	20.0	20.0	20.0	20.0	20.0	20.0	20.0
MANIFOLD VACUUM, IN HG	126	127	117	117	117	114	113
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	4.0520	4.043	2.4787	.0020	2.7330	.0042	
CO2, %	10.17	7.95	12.39	8.60	12.37	8.90	
O2, %	3.33	9.77	1.61	8.87	1.91	8.24	
HC, PPM	11546	84	9196	142	5048	202	
NOX, PPM	28	1	98	10	172	21	
AIR/FUEL RATIO	13.99	26.84	13.89	24.88	13.72	23.84	
EMISSION RATES, G/HR							
CO	484.4	1.0	335.9	5	419.1	1.1	
HC	69.3	1.0	62.6	1.7	38.9	2.7	
NOX+	.5	.0	1.9	.4	3.9	.8	
OIL TEMPERATURE, F	183	182	185	188	187		
OIL PRESSURE, PSI	48	50	50	47	47		
COOLANT TEMPERATURE, F	177	178	182	179	179		
EXHAUST PRESSURE, IN. H2O	2.0	1.0	2.0	1.0	2.0	1.0	
EXHAUST TEMPERATURE, F	414	600	480	540	524		

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1979 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	4.01	4.02	5.01	5.02	6.01	6.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/27/78	12/27/78	11/ 8/78	12/ 8/78	11/13/78	11/13/78	11/13/78
BAROMETER, MMHG	753.0	753.0	743.0	743.0	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	33	33	48	48	72	72	72
TEMPERATURE, F	76	76	80	80	81	81	81
ENGINE SPEED, RPM	750	750	1000	1000	1000	1000	1000
TORQUE, FT-LB	6.0	6.0	90.0	90.0	81.0	81.0	81.0
POWER, BHP*	.8	.8	17.0	17.0	15.4	15.4	15.4
FUEL RATE, LB./HR	2.1	2.1	12.0	11.4	7.5	7.4	7.4
IGNITION TIMING, DEG BTDC	38.0	38.0	16.0	16.0	17.0	17.0	17.0
MANIFOLD VACUUM, IN HG	19.8	19.8	1	1	2.8	2.8	2.8
INTAKE MAN. TEMP., F	127	128	84	84	88	88	88
CONCENTRATIONS, DRY BASIS							
CO, %	3.8545	0.0106	10.5002	9.1069	1.1652	0.032	
CO2, %	9.60	8.18	7.89	8.55	13.14	11.97	
O2, %	3.83	9.29	.26	.02	.92	3.59	
HC, PPM	17578	143	7168	6258	3638	91	
NOX, PPM	36	20	119	16	1121	57	
AIR/FUEL RATIO	13.81	25.89	10.22	10.61	14.57	17.74	
EMISSION RATES, G/HR							
CO	470.1	2.4	5956.2	5123.1	536.6	1.8	
HC	107.7	1.6	204.2	176.9	84.1	2.6	
NOX+	.6	.6	9.8	1.3	83.9	5.2	
OIL TEMPERATURE, F	184	184	210	210	202	202	
OIL PRESSURE, PSI	43	43	47	47	48	48	
COOLANT TEMPERATURE, F	183	184	182	182	183	182	
EXHAUST PRESSURE, IN. H2O	3.0	1.0	15.0	5.0	12.0	5.0	
EXHAUST TEMPERATURE, F	411	359	958	829	896	746	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	7.01	7.02	8.01	8.02	9.01	9.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78
TEST DATE	742.5	742.5	742.5	742.5	742.5	742.5	742.0
BAROMETER, MMHG	72	71	71	71	71	74	74
HUMIDITY, GRAINS/LB	81	81	81	80	79	79	79
TEMPERATURE, F	1000	1000	1000	1000	1000	1000	1000
ENGINE SPEED, RPM	67.5	67.5	54.0	54.0	36.0	36.0	36.0
TOQUE, FT-LB	12.8	12.8	10.3	10.3	6.8	6.8	6.9
POWER, BHP*	6.1	6.1	5.4	5.3	4.2	4.2	4.2
FUEL RATE, LB/HR	21.0	21.0	27.0	27.0	37.0	37.0	37.0
IGNITION TIMING, DEG BTDC	4.7	4.5	6.6	6.7	13.2	13.2	13.2
MANIFOLD VACUUM, IN HG	109	111	132	133	98	99	99
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	7937	0054	7314	0048	9762	0038	
CO2, %	13.32	11.26	13.33	10.67	13.16	9.80	
O2, %	1.10	4.65	1.14	5.38	1.19	6.54	
HC, PPM	3277	94	3380	92	3567	110	
NOX, PPM	644	252	301	120	1098	431	
AIR/FUEL RATIO	14.88	18.86	14.92	19.74	14.84	21.35	
EMISSION RATES, G/HR							
CO	304.8	2.7	245.8	2.2	256.0	1.5	
HC	63.2	2.3	57.0	2.1	47.0	2.1	
NOX+	40.2	20.0	16.3	8.7	47.1	27.0	
OIL TEMPERATURE, F	200	200	199	192	195		
OIL PRESSURE, PSI	49	49	49	50	51	51	
COOLANT TEMPERATURE, F	183	184	184	184	183	185	
EXHAUST PRESSURE, IN. H2O	11.0	4.0	8.0	3.0	5.0	2.0	
EXHAUST TEMPERATURE, F	859	636	807	566	665	490	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	10.01	10.02	11.01	11.02	12.01	12.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE		11/13/78	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78
TEST DATE							
BAROMETER, MMHG	741.5	741.5	742.0	741.5	742.0	741.5	741.5
HUMIDITY, GRAINS/LB	74	74	74	74	74	74	74
TEMPERATURE, F	78	78	79	78	78	78	77
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	22.5	22.5	9.0	9.0	0	0	0
POWER, BHP*	4.3	4.3	1.7	1.7	0	0	0
FUEL RATE, LB/HR	3.1	3.1	2.5	2.5	2.2	2.2	2.2
IGNITION TIMING, DEG BTDC	37.0	37.0	37.0	37.0	37.0	37.0	37.0
MANIFOLD VACUUM, IN HG	16.5	16.4	18.5	18.2	20.2	20.2	20.2
INTAKE MAN. TEMP., F	107	107	113	113	118	119	119
CONCENTRATIONS, DRY BASIS							
CO, %	4321	.0059	1.3647	.0047	2.5003	.0044	
CO2, %	13.09	8.46	11.14	8.01	10.55	7.20	
O2, %	1.61	8.60	3.34	9.16	3.55	10.26	
HC, PPM	4722	305	11489	120	21344	91	
NOX, PPM	587	237	139	60	59	20	
AIR/FUEL RATIO	15.26	24.70	15.30	25.98	13.91	28.75	
EMISSION RATES, G/HR							
CO	87.6	1.9	222.7	1.3	333.5	1.2	
HC	48.0	5.0	94.1	1.7	143.0	1.3	
NOX+	19.5	12.7	3.7	2.8	1.3	.9	
OIL TEMPERATURE, F	195	195	193	193	190	189	
OIL PRESSURE, PSI	51	51	51	51	52	53	
COOLANT TEMPERATURE, F	185	185	185	184	181	181	
EXHAUST PRESSURE, IN. H2O	4.0	2.0	4.0	2.0	4.0	1.0	
EXHAUST TEMPERATURE, F	595	389	500	491	433	467	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

+
+ CORRECTED FOR HUMIDITY
+ CORRECTED SAE J816B

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	16.01	16.02	17.01	17.02	18.01
TEST NUMBER		1	2	1	2	1
DATA SOURCE CODE		11/14/78	11/14/78	11/14/78	11/14/78	11/14/78
TEST DATE						
BAROMETER, MMHG	751.5	751.5	751.5	751.5	751.5	751.0
HUMIDITY, GRAINS/LB	44	44	44	44	44	44
TEMPERATURE, F	79	79	79	79	78	78
ENGINE SPEED, RPM	1600	1600	1600	1600	1600	1600
TORQUE, FT-LB	60.0	60.0	40.0	40.0	25.0	25.0
POWER, BHP*	17.9	17.9	12.0	12.0	7.5	7.5
FUEL RATE, LB/HR	9.2	9.4	7.2	7.2	5.6	5.7
IGNITION TIMING, DEG BTDC	27.0	27.0	34.0	34.0	36.0	36.0
MANIFOLD VACUUM, IN HG	8.0	8.0	11.7	11.2	16.2	16.2
INTAKE MAN. TEMP., F	121	123	150	151	124	124
CONCENTRATIONS, DRY BASIS						
CO, %	764.3	0025	8856	0000	1.2388	.0000
CO2, %	13.47	11.37	13.28	10.39	12.97	9.58
O2, %	1.13	4.91	1.26	6.08	1.33	7.14
HC, PPM	2632	55	2821	65	2816	57
NOX, PPM	607	256	225	88	240	45
AIR/FUEL RATIO	14.98	19.04	14.98	20.55	14.86	22.11
EMISSION RATES, G/HR						
CO	439.9	1.8	395.9	.0	434.2	0
HC	76.1	2.1	63.3	2.0	49.6	1.5
NOX+	50.2	27.3	14.4	7.9	12.1	3.5
OIL TEMPERATURE, F	206	209	208	207	205	205
OIL PRESSURE, PSI	55	55	55	55	56	56
COOLANT TEMPERATURE, F	186	187	187	187	186	187
EXHAUST PRESSURE, IN. H2O	15.0	6.0	12.0	4.0	9.0	3.0
EXHAUST TEMPERATURE, F	1040	664	945	571	858	509

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	19.01	19.02	20.01	20.02	21.01	21.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE	1	1	2	1	2	1	2
TEST DATE	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78
BAROMETER, MMHG	751.5	751.5	751.0	751.0	751.0	746.5	746.5
HUMIDITY, GRAINS/LB	41	41	43	43	43	36	36
TEMPERATURE, F	77	77	77	77	76	83	82
ENGINE SPEED, RPM	1600	1600	1600	1600	1600	2200	2200
TORQUE, FT-LB	10.0	10.0	10.0	10.0	10.0	105.0	105.0
POWER, BHP*	3.0	3.0	3.0	3.0	3.0	43.4	43.4
FUEL RATE, LB/HR	4.1	4.1	3.5	3.3	24.5	24.5	24.5
IGNITION TIMING, DEG BTDC	36.0	36.0	36.0	36.0	36.0	18.0	18.0
MANIFOLD VACUUM, IN HG	20.6	20.6	22.0	21.3	21.3	5	5
INTAKE MAN. TEMP., F	106	103	104	103	76	76	76
CONCENTRATIONS, DRY BASIS							
CO, %	1.6517	0.010	4.671	0.003	6.6754	3.0771	3.0771
CO2, %	12.47	8.06	12.22	7.03	10.30	12.88	12.88
O2, %	1.57	9.20	2.74	10.62	.71	.42	.42
HC, PPM	2591	91	7895	72	3241	414	414
NOX, PPM	257	81	125	55	428	55	55
AIR/FUEL RATIO	14.85	25.98	15.71	29.60	12.18	13.72	13.72
EMISSION RATES, G/HR							
CO	420.3	5	111.0	.1	8556.4	4257.0	4257.0
HC	33.1	2.1	94.2	1.5	208.7	28.8	28.8
NOX+	9.3	5.2	4.3	3.3	76.2	10.6	10.6
OIL TEMPERATURE, F	203	202	201	200	229	224	224
OIL PRESSURE, PSI	56	56	57	56	56	56	56
COOLANT TEMPERATURE, F	185	186	185	184	187	185	185
EXHAUST PRESSURE, IN. H2O	6.0	2.0	5.0	2.0	55.0	55.0	55.0
EXHAUST TEMPERATURE, F	760	761	721	343	1260	1360	1360

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE:	1978 FORD 140-CID CALIF.	3-WAY CATALYST
FUEL CODE:	7718	
TEST NUMBER	22.01	22.02
DATA SOURCE CODE	1	2
TEST DATE	12/27/78	11/27/78
BAROMETER, MMHG	746.5	747.0
HUMIDITY, GRAINS/LB	44	44
TEMPERATURE, F	84	83
ENGINE SPEED, RPM	2200	2200
TORQUE, FT-LB	95.0	95.0
POWER, BHP*	39.3	39.3
FUEL RATE, LB/HR	18.8	18.7
IGNITION TIMING, DEG BTDC	19.0	19.0
MANIFOLD VACUUM, IN HG	2.7	2.7
INTAKE MAN. TEMP., F	82	83
CONCENTRATIONS, DRY BASIS		
CO, %	1.4666	0.0089
CO2, %	13.63	13.16
O2, %	.79	2.91
HC, PPM	2023	0
NOX, PPM	1206	5
AIR/FUEL RATIO	14.52	16.97
EMISSION RATES, G/HR		
CO	1624.2	11.4
HC	112.5	.0
NOX+	192.1	.9
OIL TEMPERATURE, F	227	228
OIL PRESSURE, PSI	56	56
COOLANT TEMPERATURE, F	186	187
EXHAUST PRESSURE, IN. H2O	54.0	54.0
EXHAUST TEMPERATURE, F	1328	1110

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE - 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718		25.01	25.02	26.01	26.02	27.01	27.02
TEST NUMBER		1		2	1	2	1	2
DATA SOURCE CODE		11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
TEST DATE		750.5	750.5	750.5	750.5	750.5	750.5	750.5
BAROMETER, MMHG		39	39	39	39	39	39	39
HUMICITY, GRAINS/LB		79	79	77	77	78	78	78
TEMPERATURE, F		2200	2200	2200	2200	2200	2200	2200
ENGINE SPEED, RPM		42.0	42.0	26.0	26.0	11.0	11.0	11.0
TORQUE, FT-LB		1.7	2	17.2	10.7	4.5	4.5	4.5
POWER, BHP*		9.9	10.0	7.9	8.0	6.4	6.4	6.4
FUEL RATE, LB/HR		38.0	38.0	39.0	39.0	39.0	39.0	39.0
IGNITION TIMING, DEG BTDC		12.5	12.5	15.4	15.4	17.8	17.8	17.8
MANIFOLD VACUUM, IN HG		132	133	154	153	164	162	162
INTAKE MAN. TEMP., F								
CONCENTRATIONS, DRY BASIS								
CO, %		1.0748	.0076	1.5149	.0075	1.7686	.0082	
CO2, %		12.97	10.54	12.62	9.75	12.38	8.95	
O2, %		1.46	5.86	1.61	7.02	1.78	8.17	
HC, PPMC		2801	58	2719	52	3074	54	
NOX, PPM		745	357	223	56	75	23	
AIR/FUEL RATIO		15.05	20.27	14.93	21.85	14.89	23.73	
EMISSION RATES, G/HR								
CO		672.3	6.5	754.1	5.6	709.1	5.2	
HC		88.0	2.5	68.0	1.9	61.9	1.7	
NOX+		65.6	42.8	15.6	5.8	4.2	2.1	
OIL TEMPERATURE, F		217	217	215	214	210	210	
OIL PRESSURE, PSI		57	57	58	58	58	58	
COOLANT TEMPERATURE, F		188	188	189	189	187	186	
EXHAUST PRESSURE, IN. H2O		21.0	8.0	16.0	6.0	12.0	4.0	
EXHAUST TEMPERATURE, F		1022	637	967	616	936	540	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	31.01	31.02	32.01	32.02	33.01	33.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE							
TEST DATE	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	749.0	749.0	749.0	749.5	748.5	747.0	746.5
HUMIDITY, GRAINS/LB	41	41	41	41	41	41	41
TEMPERATURE, F	87	87	86	86	82	82	82
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	83.0	83.0	66.0	66.0	44.0	44.0	44.0
POWER, BHP*	43.4	43.4	34.5	34.5	23.1	23.1	23.1
FUEL RATE, LB/HR	21.2	21.2	17.4	17.4	13.3	13.3	13.4
IGNITION TIMING, DEG BTDC	24.0	24.0	32.0	32.0	38.0	38.0	38.0
MANIFOLD VACUUM, IN HG	4.4	4.4	7.7	7.7	12.0	12.0	12.0
INTAKE MAN. TEMP., F	97	98	116	116	122	122	122
CONCENTRATIONS, DRY BASIS							
CO, %	7611	.0094	.9680	.0092	1.1158	.0084	
CO2, %	13.35	12.12	12.93	11.66	12.67	10.64	
O2, %	.87	3.38	1.29	4.16	1.59	5.49	
HC, PPM	1219	25	1966	38	2326	52	
NOX, PPM	1251	934	1179	900	906	582	
AIR/FUEL RATIO	14.97	17.58	15.09	18.34	15.18	19.89	
EMISSION RATES, G/HR							
CO	1023.8	14.8	1079.7	12.3	959.8	9.6	
HC	82.3	2.0	110.1	2.6	100.5	3.0	
NOX+	238.4	208.6	186.4	171.8	110.5	93.7	
OIL TEMPERATURE, F	239	238	237	237	231	231	
OIL PRESSURE, PSI	58	58	58	58	59	59	
COOLANT TEMPERATURE, F	188	187	187	187	189	188	
EXHAUST PRESSURE, IN. H2O	67.0	28.0	46.0	20.0	30.0	13.0	
EXHAUST TEMPERATURE, F	1416	1041	1255	950	1157	872	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	34.01	34.02	35.01	35.02	36.01	36.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE	111/28/78	111/28/78	111/28/78	111/28/78	111/28/78	111/28/78	111/28/78
TEST DATE	746.5	746.5	746.5	746.5	746.5	746.5	746.5
BAROMETER, MMHG	41	41	41	41	41	41	41
HUMIDITY, GRAINS/LB	82	81	81	81	81	81	81
TEMPERATURE, F	2800	2800	2800	2800	2800	2800	2800
ENGINE SPEED, RPM	28.0	28.0	11.0	11.0	11.0	11.0	11.0
TORQUE, FT-LB	14.7	14.7	5.8	5.8	5.8	5.8	5.8
POWER, BHP*	10.6	10.6	8.2	8.2	8.2	8.2	8.2
FUEL RATE, LB/HR	40.0	40.0	40.0	40.0	40.0	40.0	40.0
IGNITION TIMING, DEG BTDC	15.0	15.0	17.7	17.7	17.7	19.0	19.0
MANIFOLD VACUUM, IN HG	140	139	162	162	162	175	175
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	1.3185	0.0081	1.4154	0.0078	1.1056	0.0076	0.0076
CO2, %	12.37	9.76	12.55	8.97	12.66	8.46	8.46
O2, %	1.71	6.75	1.57	8.03	1.51	8.92	8.92
HC, PPM	1877	60	1190	49	1782	44	44
NOX, PPM	388	210	95	47	58	31	31
AIR/FUEL RATIO	15.20	21.58	15.11	23.57	15.16	25.14	25.14
EMISSION RATES, G/HR							
CO	908.8	8.0	742.2	6.5	509.4	5.7	5.7
HC	65.0	3.0	31.3	2.0	41.2	1.6	1.6
NOX+	38.0	29.1	7.1	5.5	3.8	3.3	3.3
OIL TEMPERATURE, F	228	227	224	223	222	221	221
OIL PRESSURE, PSI	60	60	60	60	61	61	61
COOLANT TEMPERATURE, F	188	187	187	187	188	188	188
EXHAUST PRESSURE, IN. H2O	22.0	9.0	17.0	6.0	14.0	5.0	5.0
EXHAUST TEMPERATURE, F	1103	817	1112	737	1166	686	686

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	37.01	37.02	38.01	38.02	39.01	39.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	745.0	745.0	744.5	744.5	744.5	744.5	744.5
HUMIDITY, GRAINS/LB	41	41	41	41	41	41	41
TEMPERATURE, F	88	90	94	94	93	93	93
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	107.0	107.0	96.0	96.0	80.0	80.0	80.0
POWER, BHP*	66.3	66.3	59.5	59.5	49.6	49.6	49.6
FUEL RATE, LB/HR	36.2	36.3	30.4	30.2	24.6	24.5	24.5
IGNITION TIMING, DEG BTDC	19.0	19.0	19.0	19.0	25.0	25.0	25.0
MANIFOLD VACUUM, IN HG	1.0	1.0	2.1	2.1	4.5	4.5	4.5
INTAKE MAN. TEMP., F	78	80	86	87	103	103	103
CONCENTRATIONS, DRY BASIS							
CO, %	5.8471	5.7647	2.1825	3439	4782	4782	4782
CO2, %	10.58	10.83	12.74	13.24	13.61	12.22	12.22
O2, %	.24	.09	.39	1.33	.58	2.98	2.98
HC, PPM	2878	2205	940	66	493	14	14
NOX, PPM	721	23	1153	60	1264	989	989
AIR/FUEL RATIO	12.24	12.25	14.03	15.60	14.98	17.24	17.24
EMISSION RATES, G/HR							
CO	11431.7	11238.4	3985.4	690.8	751.8	15.1	15.1
HC	282.6	215.9	86.2	6.6	39.0	1.3	1.3
NOX+	199.9	6.5	298.9	17.1	281.9	254.5	254.5
OIL TEMPERATURE, F	249	255	252	252	250	250	250
OIL PRESSURE, PSI	58	58	58	58	59	59	59
COOLANT TEMPERATURE, F	189	189	187	187	189	188	188
EXHAUST PRESSURE, IN. H2O	98.0	43.0	114.0	52.0	86.0	38.0	38.0
EXHAUST TEMPERATURE, F	1415	1193	1545	1400	1526	1195	1195

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	40.01	40.02	41.01	41.02	42.01	42.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
BAROMETER, MMHG	743.5	743.5	742.5	742.5	743.0	742.5	742.5
HUMIDITY, GRAINS/LB	44	44	48	48	40	40	40
TEMPERATURE, F	87	88	84	84	85	85	85
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	64.0	64.0	43.0	43.0	27.0	27.0	27.0
POWER, BHP*	39.8	39.8	26.8	26.8	16.8	16.8	16.8
FUEL RATE, LB/HR	20.5	20.7	16.6	16.6	12.9	12.9	12.9
IGNITION TIMING, DEG BTDC	34.0	34.0	41.0	41.0	43.0	43.0	43.0
MANIFOLD VACUUM, IN HG	7.7	7.7	11.7	11.7	15.1	15.1	15.1
INTAKE MAN. TEMP., F	116	116	117	120	135	136	136
CONCENTRATIONS, DRY BASIS							
CO, %	9106	9093	1.4195	1.4088	1.2261	1.0086	
CO2, %	13.58	12.02	12.64	11.32	12.74	10.44	
O2, %	1.12	3.85	1.71	4.69	1.61	5.79	
HC, PPM	994	19	1379	30	831	26	
NOX, PPM	1312	921	927	690	372	248	
AIR/FUEL RATIO	15.10	17.98	15.21	18.89	15.28	20.25	
EMISSION RATES, G/HR							
CO	1153.2	14.4	1500.3	11.6	1020.5	9.7	
HC	63.2	1.5	73.2	2.0	34.8	1.4	
NOX+	238.3	204.8	143.1	128.9	43.6	39.2	
OIL TEMPERATURE, F	245	245	234	239	237	237	
OIL PRESSURE, PSI	59	59	61	61	61	61	
COOLANT TEMPERATURE, F	188	188	189	190	189	189	
EXHAUST PRESSURE, IN. H2O	63.0	28.0	44.0	19.0	28.0	13.0	
EXHAUST TEMPERATURE, F	1373	1000	1270	928	1266	870	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	43.01	43.02	44.01	44.02	45.01	45.02
TEST NUMBER	1	2	1	2	1	2	1
DATA SOURCE CODE							
TEST DATE	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
BAROMETER, MMHG	742.5	743.0	743.0	743.0	743.0	743.5	743.0
HUMIDITY, GRAINS/LB	46	46	46	46	46	42	42
TEMPERATURE, F	84	84	84	84	84	91	92
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3900	3900
TORQUE, FT-LB	11.0	11.0	0	0	0	100.0	100.0
POWER, BHP*	6.9	6.9	6.9	6.9	6.9	73.5	73.6
FUEL RATE, LB/HR	10.0	10.1	8.8	8.8	8.8	41.2	40.9
IGNITION TIMING, DEG BTDC	43.0	43.0	44.0	44.0	44.0	22.0	22.0
MANIFOLD VACUUM, IN HG	18.0	18.0	19.2	19.2	19.2	1.2	1.2
INTAKE MAN. TEMP., F	158	158	170	170	170	79	79
CONCENTRATIONS, DRY BASIS							
CO, %	9318	0.075	7563	.0079	4.9205	4.9424	
CO2, %	13.13	9.72	13.46	9.17	11.43	11.53	
O2, %	1.18	6.91	1.11	7.68	.22	.08	
HC, PPM	469	11	329	1.5	2330	1592	
NOX, PPM	97	43	64	32	835	26	
AIR/FUEL RATIO	15.15	21.77	15.19	23.02	12.68	12.64	
EMISSION RATES, G/HR							
CO	595.4	7.0	422.2	6.8	11044.3	10982.9	
HC	15.1	.5	9.2	.6	262.7	177.6	
NOX+	9.0	5.8	5.2	4.0	267.1	8.4	
OIL TEMPERATURE, F	232	232	230	230	251	253	
OIL PRESSURE, PSI	62	62	62	62	60	60	
COOLANT TEMPERATURE, F	189	187	188	187	189	189	
EXHAUST PRESSURE, IN. H2O	20.0	8.0	15.0	7.0	128.0	59.0	
EXHAUST TEMPERATURE, F	1337	803	1353	760	1463	1200	

* CORRECTED SAE JB16B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	46.01	46.02	47.01	47.02	48.01	48.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
TEST DATE	743.5	743.5	743.5	743.5	743.5	743.5	743.5
BAROMETER, MMHG	42	42	42	42	42	42	42
HUMIDITY, GRAINS/LB	90	94	96	97	95	95	95
TEMPERATURE, F	3900	3900	3900	3900	3900	3900	3900
ENGINE SPEED, RPM	90.0	90.0	75.0	75.0	60.0	60.0	60.0
TORQUE, FT-LB	66.2	66.2	55.1	55.1	44.1	44.1	44.1
POWER, BHP*	34.6	34.6	28.2	28.2	24.1	24.1	24.1
FUEL RATE, LB/HR	22.0	22.0	27.0	27.0	36.0	36.0	36.0
IGNITION TIMING, DEG BTDC	2.1	2.1	4.8	4.8	7.7	7.7	7.7
MANIFOLD VACUUM, IN HG	82	86	109	109	122	122	121
INTAKE MAN. TEMP., F	CONCENTRATIONS, DRY BASIS						
CO, %	1.2610	.0876	.4753	.0084	.8114	.0089	
CO2, %	13.56	13.62	13.96	12.82	13.49	12.26	
O2, %	.48	1.41	.59	2.69	.93	3.27	
HC, PPM	529	26	441	11	732	14	
NOX, PPM	1539	63	1523	1225	1474	1129	
AIR/FUEL RATIO	14.56	15.78	15.00	16.91	15.05	17.47	
EMISSION RATES, G/HR							
CO	2647.5	199.8	836.6	16.6	1229.0	15.7	
HC	55.8	2.9	39.0	1.1	55.7	1.3	
NOX+	460.3	20.5	381.9	345.7	318.1	285.2	
OIL TEMPERATURE, F	250	260	261	261	258	258	
OIL PRESSURE, PSI	60	60	59	59	60	60	
COOLANT TEMPERATURE, F	189	189	189	189	189	189	
EXHAUST PRESSURE, IN. H2O	142.0	66.0	104.0	48.0	80.0	36.0	
EXHAUST TEMPERATURE, F	1595	1331	1544	1180	1427	1108	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	49.01	49.02	50.01	50.02	51.01	51.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	746.5	746.5	746.5	746.5	746.5	746.5	746.5
HUMIDITY, GRAINS/LB	45	45	45	45	45	45	45
TEMPERATURE, F	80	80	80	80	80	81	81
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	3900	3900
TORQUE, FT-LB	40.0	40.0	25.0	25.0	10.0	10.0	10.0
POWER, BHP*	29.3	29.3	18.3	18.3	7.3	7.3	7.3
FUEL RATE, LB/HR	19.6	19.6	16.0	15.9	12.6	12.5	12.5
IGNITION TIMING, DEG BTDC	42.0	42.0	44.0	44.0	45.0	45.0	45.0
MANIFOLD VACUUM, IN HG	11.7	11.7	14.7	14.7	17.5	17.5	17.5
INTAKE MAN. TEMP., F	114	115	125	125	143	143	143
CONCENTRATIONS, DRY BASIS							
CO, %	1.1236	.0074	1.1495	.0072	.9050	.0078	
CO2, %	13.25	11.82	13.18	11.06	13.59	10.37	
O2, %	1.26	4.34	1.48	5.34	1.09	6.36	
HC, PPM	926	30	764	27	486	16	
NOX, PPM	1192	857	628	418	147	72	
AIR/FUEL RATIO	15.10	18.44	15.23	19.55	15.09	20.82	
EMISSION RATES, G/HR							
CO	1375.6	11.1	1151.8	9.3	705.6	8.5	
HC	56.9	2.2	38.4	1.7	19.0	.9	
NOX+	210.6	185.2	90.8	78.0	16.5	11.4	
OIL TEMPERATURE, F	248	250	246	245	242	241	
OIL PRESSURE, PSI	61	61	61	61	62	62	
COOLANT TEMPERATURE, F	189	190	189	189	190	189	
EXHAUST PRESSURE, IN. H2O	55.0	25.0	41.0	18.0	27.0	12.0	
EXHAUST TEMPERATURE, F	1314	1055	1295	915	1364	785	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	52.01	52.02	53.01	53.02	54.01	54.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE	11/30/78	11/30/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
TEST DATE	746.5	746.0	731.5	731.0	731.0	731.0	731.5
BAROMETER, MMHG	45	45	36	37	37	37	36
HUMIDITY, GRAINS/LB	81	81	87	89	91	91	91
TEMPERATURE, F	3900	3900	4400	4400	4400	4400	4400
ENGINE SPEED, RPM	0	0	90.0	90.0	81.0	81.0	81.0
TORQUE, FT-LB	0	0	75.7	75.8	68.2	68.2	68.2
POWER, BHP*	10.8	10.9	43.8	43.8	36.6	36.6	36.7
FUEL RATE, LB/HR	46.0	46.0	26.0	26.0	26.0	26.0	26.0
IGNITION TIMING, DEG BTDC	19.0	19.0	1.3	1.3	2.0	2.0	2.0
MANIFOLD VACUUM, IN HG	157	157	77	79	85	85	85
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	7207	.0061	4.3068	4.7250	.9659	.0221	
CO2, %	13.74	9.76	11.85	11.92	13.71	14.19	
O2, %	1.00	7.18	.52	.12	.80	1.16	
HC, PPM	513	14	1856	1587	665	14	
NOX, PPM	86	41	1063	66	1803	342	
AIR/FUEL RATIO	15.11	22.02	13.16	12.79	14.90	15.61	
EMISSION RATES, G/HR							
CO	484.8	6.1	10424.4	11122.1	2167.6	51.6	
HC	17.3	.7	225.6	187.6	75.0	1.6	
NOX+	8.3	5.9	358.5	21.8	563.8	111.0	
OIL TEMPERATURE, F	239	238	259	272	267	267	
OIL PRESSURE, PSI	63	63	59	59	58	58	
COOLANT TEMPERATURE, F	188	188	188	189	188	188	
EXHAUST PRESSURE, IN. H2O	22.0	10.0	147.0	68.0	156.0	72.0	
EXHAUST TEMPERATURE, F	1376	753	1481	1271	1392	1396	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 149-CID CATE: 3-WAY CATALYST

* * CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	58.01	58.02	59.01	59.02	60.01	60.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE		12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
TEST DATE		731.5	731.0	731.0	731.5	731.5	731.5
BAROMETER, MMHG		36	37	37	36	36	36
HUMIDITY, GRAINS/LB		90	90	90	90	90	90
TEMPERATURE, F		4400	4400	4400	4400	4400	4400
ENGINE SPEED, RPM		23.0	23.0	9.0	9.0	0	0
TORQUE, FT-LB		19.4	19.4	7.6	7.6	0	0
POWER, BHP*		18.0	18.4	14.8	14.8	12.8	12.8
FUEL RATE, LB/HR		48.0	48.0	49.0	49.0	48.0	48.0
IGNITION TIMING, DEG BTDC		13.9	13.9	16.8	16.8	18.2	18.2
MANIFOLD VACUUM, IN HG		134	134	147	147	159	159
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	7776	10110	7494	10100	5293	10108	
CO2, %	13.39	11.31	13.43	10.58	13.30	10.04	
O2, %	1.16	4.66	8.85	5.50	.92	6.19	
HC, PPM	495	12	432	7	338	7	
NOX, PPM	819	602	241	144	115	60	
AIR/FUEL RATIO		15.23	18.87	15.01	19.91	15.18	20.85
EMISSION RATES, G/HR							
CO	888.6	16.1	704.1	12.6	442.9	12.5	
HC	28.4	9	20.4	4	14.2	4	
NOX+	130.4	123.0	31.5	25.4	13.5	9.6	
OIL TEMPERATURE, F		260	260	255	253	253	
OIL PRESSURE, PSI		60	60	61	61	61	
COOLANT TEMPERATURE, F		191	191	189	188	188	
EXHAUST PRESSURE, IN. H2O		52.0	23.0	38.0	16.0	31.0	13.0
EXHAUST TEMPERATURE, F		1414	1030	1459	970	1451	912

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	61.01	61.02	62.01	62.02	63.01	63.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	731.0	731.5	731.5	731.5	731.5	731.5	731.5
HUMIDITY, GRAINS/LB	37	36	36	36	36	36	36
TEMPERATURE, F	91	94	95	95	96	96	96
ENGINE SPEED, RPM	4800	4800	4800	4800	4800	4800	4800
TORQUE, FT-LB	87.0	87.0	78.0	78.0	65.0	65.0	65.0
POWER, BHP*	79.9	79.9	71.6	71.6	59.7	59.7	59.7
FUEL RATE, LB/HR	46.5	46.4	39.6	39.6	34.0	34.0	34.0
IGNITION TIMING, DEG BTDC	27.0	27.0	28.0	28.0	30.0	30.0	30.0
MANIFOLD VACUUM, IN HG	1.5	1.5	2.0	2.0	4.3	4.3	4.3
INTAKE MAN. TEMP., F	80	81	85	85	111	111	111
CONCENTRATIONS, DRY BASIS							
CO, %	4.2113	4.3932	1.4612	1.594	5109	5104	5104
CO2, %	11.69	11.78	13.02	13.69	13.48	12.74	12.74
O2, %	.39	.11	.68	.91	.68	2.24	2.24
HC, PPM	2252	1402	925	35	260	9	9
NOX, PPM	1092	71	1626	130	1681	1337	1337
AIR/FUEL RATIO	13.07	12.89	14.56	15.38	15.08	16.58	16.58
EMISSION RATES, G/HR							
CO	10974.3	11284.0	3586.3	411.0	1118.3	25.1	25.1
HC	294.7	180.8	114.0	4.6	28.5	1.1	1.1
NOX+	396.7	25.5	556.1	46.7	512.7	448.8	448.8
OIL TEMPERATURE, F	266	271	275	275	279	279	279
OIL PRESSURE, PSI	57	57	54	54	53	53	53
COOLANT TEMPERATURE, F	190	189	190	190	190	190	190
EXHAUST PRESSURE, IN. H2O	165.0	77.0	174.0	82.0	143.0	67.0	67.0
EXHAUST TEMPERATURE, F	1523	1280	1602	1430	1600	1280	1280

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718							
TEST NUMBER	64.01	64.02	65.01	65.02	66.01	66.02		
DATA SOURCE CODE	1	2	1	2	1	2		
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78		
BAROMETER, MMHG	731.5	731.5	732.5	732.5	732.5	732.5		
HUMIDITY, GRAINS/LB	39	39	38	36	36	36		
TEMPERATURE, F	94	94	88	88	91	91		
ENGINE SPEED, RPM	4800	4800	4800	4800	4800	4800		
TORQUE, FT-LB	52.0	52.0	35.0	35.0	22.0	22.0		
POWER, BHP*	47.8	47.8	32.1	32.1	20.2	20.2		
FUEL RATE, LB/HR	29.4	29.4	24.2	24.2	19.8	19.7		
IGNITION TIMING, DEG BTDC	40.0	40.0	46.0	46.0	49.0	49.0		
MANIFOLD VACUUM, IN HG	7.1	7.1	10.8	10.8	13.9	13.9		
INTAKE MAN. TEMP., F	21	121	121	121	136	136		
CONCENTRATIONS, DRY BASIS								
CO, %	7.912	0.091	9.093	.0104	.6944	.0091		
CO2, %	13.32	12.34	13.15	11.91	13.36	11.43		
O2, %	.83	2.66	1.02	3.46	1.05	4.27		
HC, PPM	723	12	527	10	338	7		
NOX, PPM	1726	1273	1420	1040	929	657		
AIR/FUEL RATIO	15.04	16.97	15.09	17.70	15.21	18.49		
EMISSION RATES, G/HR								
CO	1320.3	19.6	1407.5	19.1	881.4	14.1		
HC	68.3	1.3	40.9	.9	21.6	.6		
NOX+	457.4	385.1	308.3	265.9	164.3	142.7		
OIL TEMPERATURE, F	275	275	255	255	268	268		
OIL PRESSURE, PSI	54	54	57	57	55	55		
COOLANT TEMPERATURE, F	191	191	191	191	191	191		
EXHAUST PRESSURE, IN. H2O	111.0	51.0	82.0	37.0	60.0	26.0		
EXHAUST TEMPERATURE, F	501	1203	1450	1109	1462	1063		

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	67.01	67.02	68.01	68.02	69.01	69.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	11/ 30/78	11/ 30/78
BAROMETER, MMHG	732.5	732.5	732.5	732.5	733.0	745.5	745.5
HUMIDITY, GRAINS/LB	36	36	36	36	36	43	43
TEMPERATURE, F	91	91	91	91	76	76	76
ENGINE SPEED, RPM	4800	4800	4800	4800	4800	850	850
TORQUE, FT-LB	9.0	9.0	9.0	9.0	9.0	0	0
POWER, BHP*	8.2	8.2	8.2	8.2	8.2	0	0
FUEL RATE, LB/HR	16.3	16.3	16.3	14.3	14.3	2.0	2.0
IGNITION TIMING, DEG BTDC	50.0	50.0	50.0	50.0	50.0	37.0	37.0
MANIFOLD VACUUM, IN HG	16.5	16.5	16.5	17.9	17.9	20.3	20.3
INTAKE MAN. TEMP., F	146	146	154	154	118	119	119
CONCENTRATIONS, DRY BASIS							
CO, %	6861	6093	6697	6697	6091	2.3812	.0068
CO2, %	13.56	10.93	13.40	10.43	8.46	7.08	
O2, %	.82	5.03	.88	5.56	6.43	10.52	
HC, PPM	339	5	311	5	22572	71	
NOX, PPM	327	164	140	69	51	36	
AIR/FUEL RATIO	15.04	19.32	15.08	20.04	15.83	29.34	
EMISSION RATES, G/HR							
CO	706.2	12.5	611.3	11.2	331.2	1.8	
HC	17.5	4	14.3	3	157.7	.9	
NOX+	46.8	30.7	17.8	11.8	1.0	1.3	
OIL TEMPERATURE, F	265	265	261	261	171	172	
OIL PRESSURE, PSI	58	58	57	57	53	53	
COOLANT TEMPERATURE, F	190	190	190	190	176	177	
EXHAUST PRESSURE, IN. H2O	46.0	20.0	39.0	16.0	1.0	1.0	
EXHAUST TEMPERATURE, F	1493	1024	1503	981	290	439	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	70.01	70.02	71.01	71.02	73.01
TEST NUMBER	1	1	2	1	2	1
DATA SOURCE CODE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
TEST DATE	745.0	745.5	745.5	745.0	743.0	743.5
BAROMETER, MMHG	43	43	43	43	45	45
HUMIDITY, GRAINS/LB	76	76	76	76	80	80
TEMPERATURE, F	850	850	850	850	1000	1000
ENGINE SPEED, RPM	10.0	10.0	15.0	15.0	67.5	67.5
TORQUE, FT-LB	1.6	1.6	2.4	2.4	12.7	12.7
POWER, BHP*	2.4	2.3	2.6	2.6	6.4	6.4
FUEL RATE, LB/HR	37.0	37.0	37.0	37.0	25.0	25.0
IGNITION TIMING, DEG BTDC	19.0	19.0	18.5	18.5	5.4	5.4
MANIFOLD VACUUM, IN HG	112	113	109	109	109	111
INTAKE MAN. TEMP., F						
CONCENTRATIONS, DRY BASIS	2.2079	0.075	1.9739	0.081	1.0555	0.082
CO, %	10.21	7.79	10.84	8.11	12.63	11.14
CO2, %	4.58	9.32	3.62	8.86	1.75	4.84
O2, %	10.767	13.6	7.936	1.56	3.204	1.16
HC, PPM	149	35	245	95	556	308
NOX, PPM						
AIR/FUEL RATIO	15.85	26.49	15.60	25.47	15.22	19.07
EMISSION RATES, G/HR						
CO	348.0	2.0	338.2	2.4	438.1	4.2
HC	85.2	1.8	67.4	2.3	66.8	3.0
NOX+	3.4	1.3	6.0	4.0	33.3	22.9
OIL TEMPERATURE, F	178	179	181	182	190	192
OIL PRESSURE, PSI	51	51	49	49	52	52
COOLANT TEMPERATURE, F	182	184	185	185	186	186
EXHAUST PRESSURE, IN. H2O	1.0	1.0	1.0	1.0	9.0	41.0
EXHAUST TEMPERATURE, F	374	430	400	392	745	605

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	74.01	74.02	75.01	75.02	76.01	76.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	743.5	743.5	743.0	743.5	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	44	44	44	44	44	44	44
TEMPERATURE, F	80	79	79	78	77	77	77
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	54.0	54.0	22.5	22.5	9.0	9.0	9.0
POWER, BHP*	10.2	10.2	4.2	4.2	1.7	1.7	1.7
FUEL RATE, LB/HR	5.4	5.4	3.1	3.1	2.6	2.6	2.6
IGNITION TIMING, DEG BTDC	30.0	30.0	36.0	36.0	36.0	36.0	36.0
MANIFOLD VACUUM, IN HG	8.3	8.3	17.1	17.1	19.9	19.9	19.9
INTAKE MAN. TEMP., F	127	127	115	110	113	112	112
CONCENTRATIONS, DRY BASIS							
CO, %	1.1126	0.066	351.9	0.079	1.8688	.0066	
CO2, %	12.46	10.52	12.08	8.06	10.49	7.53	
O2, %	2.06	5.66	3.17	9.03	4.37	9.72	
HC, PPMC	3330	106	2983	282	10173	125	
NOX, PPM	382	191	781	369	120	40	
AIR/FUEL RATIO	15.39	20.07	16.75	25.71	15.95	27.41	
EMISSION RATES, G/HR							
CO	387.6	3.1	78.1	2.7	331.4	2.1	
HC	58.3	2.5	33.2	4.8	90.6	2.0	
NOX+	19.1	12.7	24.8	18.1	3.0	1.8	
OIL TEMPERATURE, F	192	192	190	189	185	184	
OIL PRESSURE, PSI	51	51	52	52	53	53	
COOLANT TEMPERATURE, F	187	187	185	185	183	183	
EXHAUST PRESSURE, IN. H2O	7.0	3.0	5.0	1.0	3.0	1.0	
EXHAUST TEMPERATURE, F	664	518	543	437	440	374	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	771B	77.01	77.02	78.01	78.02	79.01	79.02	79.01
TEST NUMBER		1	2	1	2	1	2	1
DATA SOURCE CODE								2
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
SAROMETER, MMHG	743.0	743.0	742.5	742.5	742.5	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	44	44	45	45	45	45	45	45
TEMPERATURE, F	77	77	80	82	83	83	83	83
ENGINE SPEED, RPM	1000	1000	1600	1600	1600	1600	1600	1600
TORQUE, FT-LB	0	0	75.0	75.0	75.0	60.0	60.0	60.0
POWER, BHP*	0	0	22.6	22.6	22.6	18.1	18.1	18.1
FUEL RATE, LB/HR	2.3	2.2	10.9	10.9	10.9	9.2	9.2	9.2
IGNITION TIMING, DEG BTDC	36.0	36.0	22.0	22.0	22.0	27.0	27.0	27.0
MANIFOLD VACUUM, IN HG	21.0	21.0	5.8	5.8	5.8	8.1	8.1	8.1
INTAKE MAN. TEMP., F	119	98	104	104	104	126	127	127
CONCENTRATIONS, DRY BASIS								
CO, %	2.3210	0.062	9125	0.081	1.0397	.0077	.0077	.0077
CO2, %	9.76	7.03	13.14	11.95	12.98	11.51	11.51	11.51
O2, %	5.00	10.41	1.48	3.88	1.61	4.61	4.61	4.61
HC, PPM	20055	108	2606	95	2673	81	81	81
NOX, PPM	39	27	789	532	506	254	254	254
AIR/FUEL RATIO	15.06	29.28	15.16	18.00	15.18	18.74	18.74	18.74
EMISSION RATES, G/HR								
CO	341.1	1.8	630.0	6.7	602.6	5.5	5.5	5.5
HC	148.0	1.6	90.4	3.9	77.8	2.9	2.9	2.9
NOX+	.8	1.1	78.7	63.0	42.4	26.4	26.4	26.4
OIL TEMPERATURE, F	183	183	192	201	204	205	205	205
OIL PRESSURE, PSI	53	53	56	56	55	55	55	55
COOLANT TEMPERATURE, F	184	183	190	188	187	188	188	188
EXHAUST PRESSURE, IN. H2O	3.0	2.0	18.0	7.0	14.0	6.0	6.0	6.0
EXHAUST TEMPERATURE, F	393	370	967	701	946	712	712	712

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	80.01	80.02	81.01	81.02	82.01	82.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE	CODE						
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	742.5	742.5	743.0	743.0	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	45	45	45	45	45	45	45
TEMPERATURE, F	80	80	79	79	79	79	79
ENGINE SPEED, RPM	1600	1600	1600	1600	1600	1600	1600
TORQUE, FT-LB	25.0	25.0	10.0	10.0	10.0	10.0	10.0
POWER, BHP*	7.5	7.5	3.0	3.0	3.0	3.0	3.0
FUEL RATE, LB/HR	5.6	5.6	4.1	4.1	3.3	3.3	3.2
IGNITION TIMING, DEG BTDC	36.0	36.0	36.5	36.5	37.0	37.0	37.0
MANIFOLD VACUUM, IN HG	17.2	17.2	20.6	20.6	21.3	21.3	21.3
INTAKE MAN. TEMP., F	113	113	106	106	108	108	108
CONCENTRATIONS, DRY BASIS							
CO, %	1.9825	.0078	2.0687	.0070	1.920	.0075	1.920
CO2, %	11.76	9.81	11.36	8.24	10.66	6.87	6.87
O2, %	2.46	6.69	3.10	8.91	5.14	10.71	10.71
HC, PPM	2926	102	2034	118	5645	122	122
NOX, PPM	351	172	166	86	107	51	51
AIR/FUEL RATIO	15.28	21.48	15.80	25.38	18.39	30.02	30.02
EMISSION RATES, G/HR							
CO	719.1	4.0	558.2	3.1	50.0	3.2	3.2
HC	53.3	2.6	27.6	2.6	73.9	2.6	2.6
NOX+	18.4	12.9	6.5	5.5	4.0	3.1	3.1
OIL TEMPERATURE, F	202	202	197	197	195	195	195
OIL PRESSURE, PSI	55	55	56	56	57	57	57
COOLANT TEMPERATURE, F	188	188	185	185	186	186	186
EXHAUST PRESSURE, IN. H2O	9.0	3.0	6.0	2.0	5.0	2.0	2.0
EXHAUST TEMPERATURE, F	746	604	666	461	604	370	370

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7716	83.01	83.02	84.01	84.02	85.01	85.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE		12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
TEST DATE							
BAROMETER, MMHG	740.5	740.5	740.5	740.5	740.5	740.5	740.5
HUMIDITY, GRAINS/LB	47	47	47	47	47	47	50
TEMPERATURE, F	79	79	81	80	80	80	80
ENGINE SPEED, RPM	2200	2200	2200	2200	2200	2200	2200
TORQUE, FT-LB	79.0	79.0	63.0	63.0	26.0	26.0	26.0
POWER, BHP*	32.8	32.8	26.2	26.2	10.8	10.8	10.8
FUEL RATE, LB/HR	15.5	15.6	13.0	13.0	8.2	8.2	8.2
IGNITION TIMING, DEG BTDC	26.0	26.0	32.0	32.0	40.0	40.0	40.0
MANIFOLD VACUUM, IN HG	5.6	5.6	8.4	8.4	15.1	15.1	15.1
INTAKE MAN. TEMP., F	96	97	112	112	153	153	153
CONCENTRATIONS, DRY BASIS							
CO, %	9.67	10.02	1.0044	.0096	1.7379	.0102	
CO2, %	13.33	12.30	13.30	11.72	12.20	10.23	
O2, %	1.51	3.73	1.45	4.46	2.30	6.61	
HC, PPM	2701	65	2537	78	2712	82	
NOX, PPM	1260	843	1109	735	188	83	
AIR/FUEL RATIO	15.19	17.81	15.11	18.56	15.30	21.13	
EMISSION RATES, G/HR							
CO	876.3	11.6	813.0	9.6	900.6	7.4	
HC	131.1	3.7	103.1	3.9	70.6	3.0	
NOX+	177.3	140.2	130.7	106.9	14.2	8.8	
OIL TEMPERATURE, F	210	212	215	216	211	211	
OIL PRESSURE, PSI	58	58	57	57	58	58	
COOLANT TEMPERATURE, F	189	189	188	189	188	188	
EXHAUST PRESSURE, IN. H2O	36.0	14.0	28.0	11.0	16.0	5.0	
EXHAUST TEMPERATURE, F	1161	931	1068	887	896	755	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	86.01	86.02	87.01	87.02	88.01	88.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE		12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
TEST DATE		740.5	740.5	740.5	740.5	740.5	740.5
BAROMETER, MMHG		50	50	48	48	50	50
HUMIDITY, GRAINS/LB		79	79	78	78	81	83
TEMPERATURE, F		2200	2200	2200	2200	2800	2800
ENGINE SPEED, RPM		11.0	11.0	0	0	83.0	83.0
TORQUE, FT-LB		4.6	4.6	0	0	44.0	44.0
POWER, BHP*		6.3	6.3	4.8	4.8	21.2	21.2
FUEL RATE, LB/HR		39.0	39.0	39.0	39.0	23.0	23.0
IGNITION TIMING, DEG BTDC		18.4	18.4	22.0	22.0	4.4	4.4
MANIFOLD VACUUM, IN HG		146	143	107	107	92	96
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	2.2036	.0110	1.6185	.0091	.8936	.0102	
CO2, %	11.73	9.22	12.16	8.16	13.54	12.43	
O2, %	2.63	8.06	2.50	9.56	1.01	3.17	
HC, PPM	2456	99	1086	95	1415	35	
NOX, PPM	64	43	102	54	1296	911	
AIR/FUEL RATIO	15.32	23.35	15.69	26.26	14.98	17.34	
EMISSION RATES, G/HR							
CO	885.2	6.7	505.5	4.8	1175.7	15.7	
HC	49.5	3.0	17.0	2.5	93.5	2.7	
NOX+	3.8	3.9	4.7	4.2	250.9	206.2	
OIL TEMPERATURE, F	205	205	204	204	227	231	
OIL PRESSURE, PSI	59	59	59	59	59	59	
COOLANT TEMPERATURE, F	189	188	188	188	190	189	
EXHAUST PRESSURE, IN. H2O	11.0	3.0	8.0	3.0	61.0	26.0	
EXHAUST TEMPERATURE, F	859	640	801	530	1350	947	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	89.01	89.02	90.01	90.02	91.01	91.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
BAROMETER, MMHG	740.5	740.5	739.5	740.0	739.5	739.5	739.5
HUMIDITY, GRAINS/LB	50	50	50	50	48	50	50
TEMPERATURE, F	83	83	83	83	82	82	82
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	66.0	66.0	28.0	28.0	11.0	11.0	11.0
POWER, BHP*	35.0	35.0	14.9	14.9	5.8	5.8	5.8
FUEL RATE, LB/HR	17.3	17.4	10.8	10.8	8.3	8.3	8.3
IGNITION TIMING, DEG BTDC	32.0	32.0	41.0	41.0	40.0	40.0	40.0
MANIFOLD VACUUM, IN HG	7.5	7.5	14.7	14.7	17.7	17.7	17.7
INTAKE MAN. TEMP., F	115	115	141	141	165	165	165
CONCENTRATIONS, DRY BASIS							
CO, %	1.0772	1.0100	1.4782	0.099	1.6841	0.099	
CO2, %	12.93	11.80	12.16	10.24	12.30	9.41	
O2, %	1.47	3.90	2.01	6.08	1.88	7.20	
HC, PPM	2213	56	1993	92	1280	58	
NOX, PPM	1291	956	358	223	82	49	
AIR/FUEL RATIO	15.14	18.08	15.32	20.62	15.19	22.30	
EMISSION RATES, G/HR							
CO	1186.1	13.4	1039.2	9.4	891.6	7.8	
HC	122.4	3.8	70.4	4.4	34.0	2.3	
NOX+	209.3	187.2	37.1	31.1	6.3	5.7	
OIL TEMPERATURE, F	232	232	223	223	220	220	
OIL PRESSURE, PSI	59	59	60	60	61	61	
COOLANT TEMPERATURE, F	189	189	189	189	189	189	
EXHAUST PRESSURE, IN. H2O	43.0	18.0	16.0	8.0	14.0	6.0	
EXHAUST TEMPERATURE, F	1175	850	1017	676	1045	601	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	92.01	92.02	93.01	93.02	94.01
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	12/ 1/78	12/ 1/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78
BAROMETTER, MMHG	739.5	739.5	739.5	739.5	739.5	739.5
HUMIDITY, GRAINS/LB	4.8	4.8	3.7	3.7	5.4	3.7
TEMPERATURE, F	82	82	87	88	88	87
ENGINE SPEED, RPM	2800	2800	3300	3300	3300	3300
TORQUE, FT-LB	0	0	80.0	80.0	64.0	64.0
POWER, BHP*	0	0	49.9	49.9	40.1	39.9
FUEL RATE, LB/HR	7.1	7.1	24.9	24.9	20.8	20.8
IGNITION TIMING, DEG BTDC	41.0	41.0	23.0	23.0	33.5	33.5
MANIFOLD VACUUM, IN HG	19.0	19.0	4.2	4.2	7.4	7.4
INTAKE MAN. TEMP., F	180	180	99	100	118	118
CONCENTRATIONS, DRY BASIS						
CO, %	1.1790	.0102	.5677	.0054	.9323	.0062
CO2, %	12.61	8.75	14.02	12.53	13.26	12.06
O2, %	1.83	7.98	.67	2.94	1.15	3.58
HC, PPM	1220	54	650	11	1187	25
NOX, PPM	55	34	1387	1035	1388	1015
AIR/FUEL RATIO	15.41	23.73	14.99	17.15	15.10	17.76
EMISSION RATES, G/HR						
CO	544.0	7.4	670.6	9.6	1220.6	9.7
HC	26.3	2.0	50.1	1.0	78.0	1.9
NOX+	3.7	3.6	297.4	259.2	272.5	220.9
OIL TEMPERATURE, F	216	216	242	245	244	243
OIL PRESSURE, PSI	61	61	60	60	60	60
COOLANT TEMPERATURE, F	188	188	189	189	189	188
EXHAUST PRESSURE, IN. H2O	11.0	5.0	86.0	38.0	62.0	26.0
EXHAUST TEMPERATURE, F	1101	555	1500	1151	1334	1059

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718							
TEST NUMBER		95.01	95.02	96.01	96.02	97.01	97.02	
DATA SOURCE CODE		1	2	1	2	1	1	
TEST DATE		12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	
BAROMETER, MMHG		739.5	739.5	739.5	739.5	739.5	739.5	
HUMIDITY, GRAINS/LB		37	37	37	37	37	37	
TEMPERATURE, F		85	85	84	84	84	84	
ENGINE SPEED, RPM		3300	3300	3300	3300	3300	3300	
TORQUE, FT-LB		27.0	27.0	11.0	11.0	11.0	11.0	
POWER, BHP*		16.8	16.8	6.9	6.9	6.9	6.9	
FUEL RATE, LB/HR		13.1	13.0	10.3	10.4	8.6	8.7	
IGNITION TIMING, DEG BTDC		43.0	43.0	43.0	43.0	43.0	43.0	
MANIFOLD VACUUM, IN HG		14.6	14.6	17.5	17.5	19.1	19.1	
INTAKE MAN. TEMP., F		140	162	162	162	176	176	
CONCENTRATIONS, DRY BASIS								
CO, %	1.4284	.0059	1.1396	.0058	.0101	.0053		
CO2, %	12.58	10.69	13.00	9.93	13.35	9.27		
O2, %	1.75	5.60	1.29	6.73	1.21	7.73		
HC, PPM	1137	42	596	21	826	22		
NOX, PPM	505	322	119	65	70	36		
AIR/FUEL RATIO		15.25	19.95	15.11	21.46	15.19	22.98	
EMISSION RATES, G/HR								
CO	1196.6	6.4	743.5	5.4	444.4	4.5		
HC	47.8	2.3	19.5	1.0	22.7	1.0		
NOX+	59.2	49.6	10.9	8.6	5.4	4.5		
OIL TEMPERATURE, F		236	231	230	228	228		
OIL PRESSURE, PSI		61	62	62	62	62		
COOLANT TEMPERATURE, F		188	189	189	188	188		
EXHAUST PRESSURE, IN. H2O		29.0	12.0	20.0	8.0	15.0	7.0	
EXHAUST TEMPERATURE, F		1185	893	1268	810	1292	748	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	98.01	98.02	99.01	99.02	100.01	100.02
TEST NUMBER		1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	739.0	739.0	739.0	739.0	739.0	731.5	731.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	38	38
TEMPERATURE, F	88	88	90	90	90	83	83
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	3900	3900
TORQUE, FT-LB	75.0	75.0	60.0	60.0	60.0	25.0	25.0
POWER, BHP*	55.3	55.3	44.3	44.3	44.3	18.6	18.6
FUEL RATE, LB/HR	29.3	29.3	24.4	24.4	24.3	15.9	16.1
IGNITION TIMING, DEG BTDC	26.0	26.0	34.0	26.0	26.0	44.0	44.0
MANIFOLD VACUUM, IN HG	4.2	4.2	7.3	7.3	7.3	14.1	14.1
INTAKE MAN. TEMP., F	97	97	119	119	119	124	124
CONCENTRATIONS, DRY BASIS							
CO, %	4572	4047	7726	4050	10017	.0092	.0092
CO2, %	14.19	12.86	13.74	12.45	13.28	11.10	11.10
O2, %	.56	2.75	.88	3.27	1.44	5.41	5.41
HC, PPMC	509	9	768	116	694	20	20
NOX, PPM	1502	1165	1565	1133	613	423	423
AIR/FUEL RATIO	14.98	16.95	15.03	17.42	15.28	19.60	19.60
EMISSION RATES, G/HR							
CO	823.2	9.8	1166.9	8.9	1005.3	12.0	12.0
HC	46.0	.9	58.3	1.4	35.0	1.3	1.3
NOX+	378.4	335.0	330.7	279.8	86.3	77.5	77.5
OIL TEMPERATURE, F	247	247	258	258	244	244	244
OIL PRESSURE, PSI	61	61	60	60	62	62	62
COOLANT TEMPERATURE, F	191	191	189	189	189	189	189
EXHAUST PRESSURE, IN. H2O	111.0	51.0	81.0	36.0	41.0	18.0	18.0
EXHAUST TEMPERATURE, F	1554	1197	1443	1140	1342	969	969

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	101.01	101.02	102.01	102.02	103.01	103.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 6/78	12/ 6/78
BAROMETER, MMHG	731.5	731.0	731.0	731.0	731.0	746.5	746.5
HUMIDITY, GRAINS/LB	38	38	38	38	38	37	37
TEMPERATURE, F	85	85	85	85	85	91	91
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	4400	4400
TORQUE, FT-LB	10.0	10.0	10.0	10.0	10.0	68.0	68.0
POWER, BHP*	7.5	7.5	7.5	7.5	7.5	56.0	56.0
FUEL RATE, LB/HR	12.8	12.7	12.7	12.7	12.7	31.4	31.3
FUEL RATE, LBS/HR							
IGNITION TIMING, DEG BTDC	44.0	44.0	44.0	44.0	44.0	30.0	30.0
MANIFOLD VACUUM, IN HG	16.9	16.9	16.9	16.9	16.9	4.9	4.9
INTAKE MAN. TEMP., F	145	145	145	145	145	108	108
CONCENTRATIONS, DRY BASIS							
CO, %	7.869	7.869	7.869	7.869	7.869	.0094	.0094
CO2, %	13.74	13.74	13.74	13.74	13.74	14.24	13.17
O2, %	1.04	1.04	1.04	1.04	1.04	6.6	2.56
HC, PPM	471	471	471	471	471	516	117
NOX, PPM	161	161	161	161	161	1811	1222
AIR/FUEL RATIO	15.12	15.12	15.12	15.12	15.12	15.02	16.76
EMISSION RATES, G/HR							
CO	624.9	10.5	441.7	9.6	1014.0	21.2	21.2
HC	18.8	5	10.0	4	49.5	1.8	1.8
NOX+	17.9	9.3	8.2	5.7	482.7	365.9	365.9
OIL TEMPERATURE, F	243	243	240	240	240	269	269
OIL PRESSURE, PSI	62	62	62	62	62	54	54
COOLANT TEMPERATURE, F	190	190	188	188	188	192	192
EXHAUST PRESSURE, IN. H2O	28.0	28.0	22.0	22.0	22.0	121.0	56.0
EXHAUST TEMPERATURE, F	1397	1397	909	909	909	1558	1203

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	104.01	104.02	105.01	105.02	106.01	106.02
TEST NUMBER	1	2	1	2	1	1	2
DATA SOURCE CODE	12 / 6/78	12 / 6/78	12 / 6/78	12 / 6/78	12 / 6/78	12 / 6/78	12 / 6/78
TEST DATE							
BAROMETER, MMHG	746.5	746.5	747.0	747.0	746.5	747.5	747.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	37	37
TEMPERATURE, F	91	91	88	88	88	88	88
ENGINE SPEED, RPM	4400	4400	4400	4400	4400	4400	4400
TORQUE, FT-LB	54.0	54.0	23.0	23.0	9.0	9.0	9.0
POWER, BHP*	44.5	44.5	18.9	18.9	7.4	7.4	7.4
FUEL RATE, LB/HR	26.9	26.8	18.3	18.3	14.8	14.8	14.9
IGNITION TIMING, DEG BTDC	39.0	39.0	47.0	47.0	48.0	48.0	48.0
MANIFOLD VACUUM, IN HG	7.9	7.9	14.5	14.5	17.3	17.3	17.3
INTAKE MAN. TEMP., F	121	121	135	135	147	147	147
CONCENTRATIONS, DRY BASIS							
CO, %	7789	0100	8201	0104	7474	0089	
CO2, %	13.91	12.69	13.47	11.37	13.81	10.79	
O2, %	.92	3.08	1.15	4.83	.92	5.65	
HC, PPM	658	16	463	14	572	11	
NOX, PPM	1683	1058	733	486	206	98	
AIR/FUEL RATIO	15.07	17.22	15.20	18.99	15.04	19.94	
EMISSION RATES, G/HR							
CO	1282.2	19.0	942.9	15.0	683.6	11.1	
HC	54.4	1.6	26.7	1.1	26.3	.7	
NOX+	386.7	280.9	117.6	98.2	26.2	17.0	
OIL TEMPERATURE, F	267	267	257	257	254	254	
OIL PRESSURE, PSI	55	55	56	56	57	57	
COOLANT TEMPERATURE, F	190	190	190	190	189	189	
EXHAUST PRESSURE, IN. H2O	94.0	43.0	53.0	23.0	39.0	17.0	
EXHAUST TEMPERATURE, F	1465	1138	1416	991	1459	949	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718	107.01	107.02	108.01	108.02	109.01	109.02
TEST NUMBER	1	1	2	1	2	1	2
DATA SOURCE CODE							
TEST DATE	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78
BAROMETER, MMHG	747.5	747.5	746.5	746.5	746.5	746.5	746.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	37	37
TEMPERATURE, F	87	87	86	89	91	91	91
ENGINE SPEED, RPM	4400	4400	4800	4800	4800	4800	4800
TORQUE, FT-LB	.0	.0	65.0	65.0	58.4	58.4	52.0
POWER, BHP*	.0	.0	13.1	13.1	33.4	33.4	46.7
FUEL RATE, LB/HR	13.1	13.1	48.0	48.0	33.0	33.0	29.4
IGNITION TIMING, DEG BTDC	48.0	48.0	18.6	18.6	5.1	5.1	40.0
MANIFOLD VACUUM, IN HG	18.6	18.6	157	157	100	100	120
INTAKE MAN. TEMP., F							
CONCENTRATIONS, DRY BASIS							
CO, %	7748	0092	5974	0099	7031	0093	
CO2, %	13.33	10.29	13.84	12.99	13.62	12.58	
O2, %	1.00	6.28	.72	2.44	.82	2.75	
HC, PPMC	1861	10	764	116	595	113	
NOX, PPN	95	41	1843	1415	1869	1260	
AIR/FUEL RATIO							
EMISSION RATES, G/HR							
CO	642.7	10.6	1241.0	22.9	1292.3	19.7	
HC	77.5	.6	79.7	1.8	54.9	1.4	
NOX+	11.0	6.5	534.1	458.3	479.4	370.1	
OIL TEMPERATURE, F	250	250	253	268	275	275	
OIL PRESSURE, PSI	57	57	56	56	53	53	
COOLANT TEMPERATURE, F	188	188	190	192	190	190	
EXHAUST PRESSURE, IN. H2O	33.0	13.0	133.0	63.0	110.0	50.0	
EXHAUST TEMPERATURE, F	1476	945	1545	1204	1512	1187	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE : 1978 FORD 140-CID CALIF. 3-WAY CATALYST

CORRECTED SAE J816B
CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE:	7718					
TEST NUMBER		113.01	113.02	114.01	114.02	
DATA SOURCE CODE		1	2	1	2	
TEST DATE	12/27/78	12/27/78	12/27/78	12/27/78	12/27/78	
BAROMETER, MMHG	752.5	752.5	752.5	752.5	752.5	
HUMIDITY, GRAINS/LB		35	35	35	35	
TEMPERATURE, F	94	95	94	95	95	
ENGINE SPEED, RPM	5000	5000	5000	5000	5000	
TORQUE, FT-LB	66.0	86.0	86.0	86.0	86.0	
POWER, BHP*	80.1	80.1	80.1	80.1	80.1	
FUEL RATE, LB/HR	49.1	48.9	49.1	49.1	48.9	
IGNITION TIMING, DEG BTDC	27.0	27.0	27.0	27.0	27.0	
MANIFOLD VACUUM, IN HG	1.5	1.5	1.5	1.5	1.5	
INTAKE MAN. TEMP., F	81	82	81	82	82	
CONCENTRATIONS, DRY BASIS						
CO, %	4.7740	4.8215	4.7740	4.8215	4.8215	
CO ₂ , %	11.77	11.75	11.77	11.75	11.75	
O ₂ , %	.26	.11	.26	.11	.11	
HC, PPM	2358	1351	2358	1351	1351	
NO _x , PPM	1232	450	1232	450	450	
AIR/FUEL RATIO						
	12.81	12.76	12.81	12.76	12.76	
EMISSION RATES, G/HR						
CO	12610.0	12747.3	12612.9	12748.8	12748.8	
HC	312.8	179.4	312.9	179.4	179.4	
NO _x +	451.5	165.0	451.5	164.9	164.9	
OIL TEMPERATURE, F						
OIL PRESSURE, PSI	278	282	278	282	282	
COOLANT TEMPERATURE, F	52	51	52	51	51	
EXHAUST PRESSURE, IN. H ₂ O	190	190	190	190	190	
EXHAUST TEMPERATURE, F	192.0	82.0	192.0	82.0	82.0	
	1550	1215	1550	1215	1215	

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

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